Loch Toftingall Wind Farm

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Scoping Report

May 2019

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Loch Toftingall Wind Farm

Scoping Report

Applicant

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1. INTRODUCTION

Purpose of the Scoping Report

1.1. This Scoping Report (the Report) has been prepared on behalf of SETT Wind Development Ltd ("the Applicant"). The Applicant is proposing to submit a major development planning application to the Highland Council (the Council) under the Town and Country Planning (Scotland) Act (1997)[1], as amended by the Planning etc. (Scotland) Act 2006[2], for permission to construct and operate Loch Toftingall Wind Farm (the Development). It is intended that this Report will provide the required information to allow the Council and key consultees to form a Scoping Opinion on the Development and its associated Environmental Impact Assessment (EIA).

1.2. The Development would involve the construction and operation of a wind farm on land located approximately 16 km (kilometres) west of Wick and 2 km south-east of Spittal (the Site). The Site is approximately 375 hectares (ha) in size and is centred on approximate National Grid Reference (eastings) 318770 and (northings) 952645. The location of the Site is shown in Figure 1, Appendix A and is described in Section 2 of this Report.

1.3. It is expected that the Development will consist of up to six turbines with a maximum height to blade tip of 138.5 metres (m) and have a total generating capacity of between 20 – 35 MW. Ancillary infrastructure will also be required as part of the Development and may include a substation, new access tracks and site entrance, temporary construction compound, crane hardstandings and a permanent meteorological mast. A battery energy storage facility is likely to be included as part of the Development, and this is likely to be located next to the substation.

1.4. Given the iterative nature of the EIA process, the final layout of the Development is still being refined. The Development is therefore being scoped on a preliminary turbine layout which would represent the likely geographical spread of turbine and infrastructure across the Site, the preliminary turbine layout is shown in Figure 2, Appendix A. The results of the Scoping process will feed into the iterative design of the Development.

1.5. Pre-application consultation was undertaken with the Council and key consultees in March 2019, and the outcome of that stage has been taken into account when proposing the scope of the EIA as detailed in this report.

[1] Town and Country Planning (1997) Town and Country Planning (Scotland) Act 1997 [Online] Available at: https://www.legislation.gov.uk/ukpga/1997/8/contents (Accessed 10/3/2019)
[2] UK Government (2006) Planning etc. (Scotland) Act 2006 [Online] Available at: https://www.legislation.gov.uk/asp/2006/17/contents (Accessed 10/3/2019)

The Applicant

1.6. SETT Wind Development Limited is a company formed by Infinergy Limited and Boralex LLP.

1.7. Infinergy is a UK based renewable energy company with a strong focus on the development of onshore wind energy in Scotland and Wales. Infinergy develops wind energy projects from inception through to construction and operation, and has offices in Wimborne (England) and Edinburgh (Scotland). For more information visit http://www.infinergy.co.uk.

1.8. Boralex LLP is a Canadian based independent power provider. Boralex has developed, and now operates, a large portfolio of wind farms as well as a number of solar parks, primarily in Canada and France. The company also owns and operates large hydro-electricity projects in Canada. Further information can be found at http://www.boralex.com/projects

1.9. Boralex is investing in a portfolio of Infinergy wind farm proposals in Scotland, and the Loch Toftingall project is included within this programme.

Screening and Scoping

1.10. The EIA will be undertaken in accordance with the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017[3] ("the EIA Regulations").

Screening

1.11. With regards to energy wind developments, Schedule 2 of the EIA Regulations lists types of developments which may require an EIA if significant environmental effects are anticipated.

1.12. EIA regulations state that if *"the development involves the installation of more than 2 turbines; or the height of any turbine or height of any other infrastructure exceeds 15 metres"* then that proposal may require an EIA.

1.13. Given the scale of the Development and the potential for significant effects to occur as a result of the Development, the Applicant has elected to undertake an EIA without seeking a Screening Opinion from the Council. Further description of the EIA process is presented in Section 5 of this Report.

Scoping Report

1.14. As per Section 17 (2) of Part 4 of the EIA Regulations, the Applicant is seeking to confirm the scope of the required assessment which is to be provided in the EIA Report *i.e.* a "Scoping Opinion". To aid this process, this Report includes the following:

[3] Town and Country Planning (2017) Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 [Online] Available at: http://www.legislation.gov.uk/ssi/2017/102/contents/made (Accessed 10/3/2019)

- A description of the location of the Development including figures identifying the Site and the proposed parameters of Development;
- Figures identifying the designated and sensitive environmental receptors surrounding the Site; and
- A brief description of the nature and purpose of the Development and its potential resultant effects.

1.15. This Report has considered the different aspects of the environment likely to be significantly affected by the Development and has identified those topics which require consideration as part of the EIA, with a view to inviting comments on the approach to the EIA and the content of the EIA Report.

Consultation

1.16. The process of identifying environmental effects is both iterative and cyclical, running in tandem with the iterative design process. This has already begun with pre-application consultation undertaken with the Council and key consultees in March 2019. The initial design considerations raised during the pre-application meeting included:

- Landscape and visual amenity, particularly in regards to:
  - Designing the Development to fit within the existing wind energy development cluster in regards to scale and minimising cumulative effects;
- Cumulative Effects in regards to noise and residential amenity;
- Effects upon peat; and
- Connectivity between natural heritage designations; e.g. Caithness and Sutherland Peatlands Special Protection Area (SPA)/Site of Special Scientific Interest (SSSI)/Ramsar Site, Caithness Lochs SPA and Shielton Peatlands SSSI).

1.17. Based upon the comments received as part of the pre-application meeting, peat probing has been undertaken across the Site and informed the scoping layout (see Section 12). Additionally, turbines have been located away from the western part of the Site to preserve noise limits and residential amenity. As further environmental surveys and site visits are undertaken, the design will be refined to address design considerations raised during pre-application consultation.

1.18. As the design and EIA progresses, consultation will form an integral part of the process. This will include one or more public consultation events held in locations near the Site providing members of the public the opportunity to learn more about the Development and give feedback and comments to the project team. Consultation on specific technical issues will also be undertaken with relevant consultees, where appropriate, as part of the EIA process. A list of consultees it is suggested the Council provide with this Report is contained in Appendix B.

2. THE SITE

2.1. The Site is located approximately 16 kilometres (km) west of Wick, 2 km south-east of Spittal and 4.5 km to the west of Watten in Caithness, The Highlands. The Site covers an area of approximately 375 ha and is centred on approximate National Grid Reference (eastings) 318,770 and (northings) 952645 with the location and extent of the Site as shown in Figure 1, Appendix A.

2.2. The Site is relatively flat ranging from approximately 100 m Above Ordnance Datum (AOD) in the west, sloping gradually towards the east where it is approximately 70 m AOD. Spittal Hill lies approximately 2 km to the north-west and rises to an elevation of 176 m AOD. Backlass Hill lies approximately 1 km to the north-east with an elevation of 112 m AOD.

2.3. The Site predominately comprises commercial forestry plantation consisting of sitka spruce. There is a network of forest rides within the plantation but few forest tracks. Loch of Toftingall lies within the centre of the site and is effectively enclosed by plantation forestry. The Loch is used for fishing, except in the winter when angling rarely takes place. There is a boat house on the north western-shore of the Loch and an 80 m high temporary anemometry mast in the western part of the Site.

2.4. To the immediate south of the Site lies the large Halsary coniferous plantation. Further to the south, there is a large expanse of open 'flow country' peat moorland with small lochs which is covered by a number of international ecological designations.

2.5. The Site is adjacent to several constructed wind farms including Achlachan, to the west, Causeymire and Bad a Cheo to the south-west and the consented but as yet unbuilt Halsary, which lies immediately to the south within plantation which is due to be felled as part of the wind farm development (see Figures 2 and 3, Appendix A).

2.6. The Site lies within the Wick River catchment. Loch of Toftingall lies in the centre of Site, with Alllt Eireannaich draining east into the loch and Loch Burn draining to the south from the loch into the Burn of Acharole which flows in a shallow valley to the east. There are also several unnamed burns and drainage/irrigation channels to the north that drain into the loch.

2.7. The A9 lies to the west of the Site, and the B870 passes to the north. No public roads are located within the Site. There is a track that leads from the B870 to the boat house on the northern shore of the Loch. There are a number of residential properties within 1 km of the Site Boundary, located on the A9, the B870, the Backlass Hill area and the head of the Acharole Burn.

2.8. There are a number of electricity transmission lines that feed into the large Mybster substation which lies approximately 500m to the south-west of the Site. To the south of the substation, an electricity transmission line runs parallel to the A9.

3. SITE SELECTION AND DESIGN EVOLUTION

Site Selection

3.1. The Applicant has identified the Site through an iterative site selection process seeking to avoid areas of high environmental sensitivity whilst choosing sites which are technically and economically viable. In doing so the following criteria have been used:

- No landscape designations within or adjoining the Site;
- An assessment of known ecological/ ornithological constraints within the vicinity of the Site;
- Located more than 2 km from densely populated settlements;
- Exposed location with good wind speeds;
- Close proximity to a potential grid connection point;
- Land area available to accommodate sufficient and viable generating capacity;
- Availability of a good access route options to the site involving minimal environmental disruption; and
- No, or potentially resolvable, civil and military radar issues.

3.2. The purpose of a wind farm is to harness energy from the wind. It is important that wind turbines are sited in the optimum position to maximise the wind yield whilst minimising environmental effects.

3.3. The optimum layout of a wind farm depends on a range of criteria. These vary depending on the type and size of turbine as well as the local topography and the turbulence created by the ground conditions within and around the Site. Turbine manufacturers recommend that the turbines be spaced between four and five rotor diameters apart depending on the prevailing wind direction, turbine type and site characteristics. The available capacity of the electricity grid into which a wind farm will connect can also limit its size.

Design Evolution

3.4. An initial turbine layout was formulated prior to survey work commencing which consisted of twelve turbines, 125 m to tip, located across the Site, including to the north and south-east of Loch Toftingall.

3.5. Following commencement of the ornithological surveys, the next iteration of the turbine layout incorporated the results of the bird survey work, reducing the number to six turbines, 149.9 m to tip. This iteration included four turbines to the west of Loch Toftingall and two on the eastern side in order to keep the area to the north and to the south-east of the loch free of turbines to preserve corridors for osprey and divers that had been recorded feeding on the loch.

3.6. This layout was then amended following an initial cumulative noise assessment. The two western-most turbines were relocated to the eastern side of the loch whilst continuing to preserve the ornithological corridors to the north and south east.

3.7. The next iteration (which is this scoping turbine layout) then involved reducing the tip height to 138.5 m to reduce landscape and visual impacts and re-siting some of the turbine locations following the phase 1 peat survey work to ensure that no turbines are located within peat that is greater than 3 m in depth.

3.8. Throughout the remainder of the EIA process, the layout will further evolve to take into consideration the results of additional surveys and data gathered through the assessment process. This iterative design process ensures that the final layout of the wind farm submitted responds to the constraints identified onsite. Further information about the iterative design process and the reasoning behind the key changes will be reported in the EIA Report.

4. PROJECT DESCRIPTION

4.1. The Development will consist of:

- Wind turbines and turbine foundations;
- Access tracks and crane pads;
- On site power collection system (transformers and underground cables);
- Substation compound including a battery energy storage array;
- Construction compound; and
- Permanent meteorological mast.

Turbines

4.2. The proposed details are as follows:

- Number of turbines: up to 6;
- Maximum height to blade tip: 138.5 m;
- Maximum generating capacity (per turbine): 3 - 5 MW; and
- Total generation capacity: between 20 and 35 MW.

4.3. An indicative turbine layout is shown in Figure 2, Appendix A. This layout has been developed with due consideration to known constraints *e.g.*, watercourses, cultural heritage features, peat depth, ornithology, and proximity to dwellings as discussed in Section 3.

4.4. For the purposes of the EIA, a precautionary approach will be taken and the largest prospective turbine will be assessed as the selected option. The worst-case scenario will be evaluated for each topic; for example, the maximum tip height and rotor diameter for landscape and visual and the maximum rotor diameter and a lower feasible hub height for ornithology.

Access Tracks

4.5. The turbine components would be delivered to the Site using the existing road network. The use of public roads will require further consultation with the appropriate bodies.

4.6. Previous site visits and route modelling and inspection suggests that turbine components could be delivered to site from Wick Harbour via the A99 to Latheron and then northwards on the A9. A detailed further abnormal loads assessment will be undertaken to determine the most suitable route of turbine delivery to the Site. The traffic assessment would determine any requirements for upgrading of junctions or minor roads and would include swept path analysis.

4.7. It is possible that local access to the Site will be taken from the north via the B870 or the west via the A9; however, all access options from both the north and west are currently being considered.

Temporary Construction Compound

4.8. A temporary construction compound will be required during the construction of the Development, forming an area of hardstanding providing space for temporary welfare, parking, lay down areas and potentially concrete batching.

Anemometry Mast

4.9. An anemometry mast will be required for the life span of the Development, of a height similar to the hub height of the proposed wind turbines.

Electrical Infrastructure

4.10. Onsite underground cabling will be laid alongside the access tracks where possible, linking the turbine transformers to a site substation. The substation will include a single storey building housing the electrical infrastructure, although certain elements will be externally located within a fenced compound.

Grid Connection

4.11. The connection to the grid falls under a separate consent process and will be subject to a separate application. As such it will not be considered as part of this EIA. However, a high-level desk based environmental review of the likely connection route will be included as an appendix to the EIA Report.

Construction of the Development

4.12. The construction phase of the Development will comprise on-site preparation and construction activities, supported by deliveries of materials, components and staff to the Site.

4.13. Construction is expected to take approximately 12 months, depending on weather and ground conditions, as well as other technical and environmental factors and is likely to consist of the following principal operations:

- Forestry activities;
- Extraction of stone from nearby quarries;
- Construction of site tracks including water crossings/culverts;
- Construction of a temporary construction compound and office facilities;
- Construction of the substation buildings/compounds;
- Construction of turbine foundations;
- Construction of crane hardstanding areas;

- Excavation of cable trenches and cable laying adjacent to the site tracks;
- Installation of temporary and permanent drainage;
- Erection and commissioning of wind turbines; and
- Reinstatement of temporary works areas such as the construction compound.

Decommissioning

4.14. The Development will be designed to operate for a period of 25 years. Provision will be made for the Development to be decommissioned and the site restored at the expiry of consent. Typically, all above ground infrastructure will be dismantled and removed from the site, cables and turbine foundations will be cut 1 m below ground level and covered with topsoil. Alternatively, the Applicant may apply for consent to extend the operational life of the Development in accordance with the relevant legislation at the time of any such application.

5. ENVIRONMENTAL IMPACT ASSESSMENT

5.1. EIA is an iterative assessment process with the aim of avoiding or reducing the potential effects resulting from the Development through the continual refinement of the design of the Development. These effects can occur throughout all phases of the Development from construction, through operation and during decommissioning. Any potential effects will be mitigated utilising the mitigation hierarchy of avoid, reduce, offset and compensate.

5.2. Part 1 Section 4 (2), (3) and (4) of the EIA Regulations details what information is required to be included within the EIA Report and states:

"(2) The EIA must identify, describe and assess in an appropriate manner, in light of the circumstances relating to the proposed development, the direct and indirect significant effects of the proposed development (including, where the proposed development will have operational effects, such operational effects) on the factors specified in paragraph (3) and the interaction between those factors.

5.3. *(3) The Factors are –*

- *Population and human health;*
- *Biodiversity, and in particular species and habitats protected under Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora and Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds;*
- *Land, soil, water, air and climate; and*
- *Material assets, cultural heritage and the landscape.*

5.4. *(4) The effects to be identified, described and assessed under paragraph (2) include the expected effects deriving from the vulnerability of the development to risks, so far as relevant to the development, of major accidents and disasters."*

5.5. The results of the EIA will be presented in an EIA Report, which, as prescribed in the EIA Regulations is required to include a *"description of the likely significant effects"* of the Development; effects which are not considered to be significant do not need to be described. It is therefore necessary for the scope of the EIA to be appropriately defined to ensure all significant effects are covered.

Scope of EIA

5.6. The aim of the Scoping process is to identify key environmental issues at an early stage, to determine which elements of the Development are likely to result in significant effects on the environment and to establish the extent of survey and assessment required for the EIA.

5.7. This Report therefore provides details of the assessment areas which will be included within the EIA Report to meet the information requirements as set out in Schedule 4 of the EIA Regulations. The scope for the assessment areas are detailed in Sections 6 - 21 of this Report and comprise of the following:

- Section 6: Planning and Energy Policy;
- Section 7: Forestry;
- Section 8: Landscape and Visual;
- Section 9: Ecology;
- Section 10: Ornithology;
- Section 11: Cultural Heritage;
- Section 12: Geology and Peat;
- Section 13: Hydrology and Hydrogeology;
- Section 14: Noise;
- Section 15: Traffic and Transport;
- Section 16: Aviation;
- Section 17: Socio-economics, Tourism and Recreation;
- Section 18: Shadow Flicker;
- Section 19: Telecommunications and Utilities;
- Section 20: Health and Safety; and
- Section 21: Climate Change and Carbon.

5.8. Through the EIA process, effects arising during the construction, operation and decommissioning phases will be assessed, and mitigation measures will be considered for each assessment area, where appropriate. These considerations will also be detailed within the EIA Report.

EIA Process

5.9. The EIA is an iterative process of assessment and design, whereby prediction and assessment of effects will inform the eventual design of the Development. The Development can then be refined in order to avoid or reduce potential environmental effects where necessary.

5.10. The EIA Report, which reports the findings of the EIA as set out in the EIA Regulations, is required to "*describe the likely significant effects*" of a development; effects that are not considered significant do not need to be described to meet the requirements of the EIA Regulations.

5.11. The main steps of the EIA process are broadly summarised as follows:

- Scoping: The Scoping Opinion from the Council will be used to inform and focus the scope of the EIA on likely significant effects that could be anticipated to occur as a result of the Development.
- Baseline studies: Desk-based assessment (DBA), baseline surveys and site visits will be undertaken, where appropriate, in order to determine

the baseline conditions of the environment and area that may be affected by the Development.

- Predicting and assessing effects: Potential interactions between the Development and the baseline conditions will be considered. The nature of the effects will be predicted and assessed; e.g. direct or indirect, positive or negative, long, medium or short term; temporary or permanent. Potential cumulative effects arising from Development in conjunction with other proposed or consented developments will also be considered.
- Mitigation and assessment of residual effects: Potential effects will be avoided or reduced wherever possible through embedded mitigation. Where this is not possible, operational mitigation or other measures to reduce and/or offset significant effects will be proposed. The residual effects will then be assessed to determine any effects predicted to remain following implementation of the recommended mitigation measures.
- Production of the EIA Report: The results of the EIA will be set out in the EIA Report.

Assessment Methodology

5.12. In order to assess the potential effects arising from the Development, the significance of such effects will be determined. The determination of significance relates to the sensitivity of the resource or receptor being affected and the magnitude of change as a result of the impact. The assessment of effects will combine professional judgement together with consideration of the following.

- The sensitivity of the resource or receptor under construction;
- The magnitude of potential impact in relation to the degree of change which occurs as a result of the Development;
- The type of effect, i.e. adverse, beneficial, neutral or uncertain;
- The probability of the effect occurring, i.e. certain, likely or unlikely; and
- Whether the effect is temporary, permanent and/or reversible.

5.13. A generalised methodology for assessing significant effects is detailed below; however, each individual technical area will have a specific assessment methodology which may vary from that detailed in the following subsections.

Sensitivity of Receptors

5.14. The sensitivity of the receptors, including the importance of environmental features on or near to the Site, will be assessed in line with best practice, legislation or statutory designations and/or judgement.

5.15. Table 5.1 details a framework for determining the sensitivity of receptors. Each technical assessment will specify their own criteria that will be applied during the EIA and details will be provided in the relevant EIA Report chapter.

Table 5.1: Framework for Determining Sensitivity of Receptors

Sensitivity of Receptor	Definition
Very High	The receptor has little or no ability to absorb change without fundamentally altering its present character, is of very high environmental value, or of international importance.
High	The receptor has low ability to absorb change without fundamentally altering its present character, is of high environmental value, or of national importance.
Medium	The receptor has moderate capacity to absorb change without significantly altering its present character, has some environmental value, or is of regional importance.
Low	The receptor is tolerant of change without detriment to its character, is low environmental value, or local importance.
Negligible	The receptor is resistant to change and is of little environmental value.

Magnitude of Effect

5.16. The magnitude of potential impacts will be identified through consideration of the Development, the degree of change to baseline conditions predicted as a result of the Development, the duration and reversibility of an impact and professional judgement, best practice guidance and legislation.

5.17. General criteria for assessing the magnitude of an impact are presented in Table 5.2. Each technical assessment will apply their own appropriate criteria during the EIA, with the details provided in the relevant EIA Report chapter.

Table 5.2: Framework for Determining Magnitude of Effects

Magnitude of Effects	Definition
High	A fundamental change to the baseline condition of the asset, leading to total loss or major alteration of character.
Medium	A material, partial loss or alteration of character.
Low	A slight, detectable, alteration of the baseline condition of the asset.
Negligible	A barely distinguishable change from baseline conditions.

5.18. If impacts of zero magnitude (i.e. none / no change) are identified, this will be made clear in the assessment.

Significance of Effect

5.19. The sensitivity of the asset and magnitude of the predicted impacts will be used as a guide, in addition to professional judgement, to predict the significance of the likely effects. Table 5.3 summarises guideline criteria for assessing the significance of effects.

Table 5.3: Framework for Assessment of the Significance of Effects

Magnitude of Impact	Sensitivity of Receptor				
	Very High	High	Medium	Low	Negligible
High	Major	Major	Moderate	Moderate	Minor
Medium	Major	Moderate	Moderate	Minor	Negligible
Low	Moderate	Moderate	Minor	Negligible	Negligible
Negligible	Minor	Minor	Negligible	Negligible	Negligible

5.20. Effects predicted to be of major or moderate significance are considered to be 'significant' in the context of the EIA Regulations, and are shaded in light grey in the above table.

5.21. Zero magnitude impacts upon a receptor will result in no effect, regardless of sensitivity.

Mitigation & Enhancement

5.22. Where the EIA identifies significant adverse environmental effects, mitigation measures will be proposed in order to avoid, reduce, offset or compensate those effects. These mitigation measures will likely include the movement or loss of turbines, access tracks and other infrastructure (i.e. embedded mitigation); or the provision of specific measures during construction and operation phases of the Development.

5.23. The extent to which mitigation or other measures are taken into account will depend on the facts of each case. In some cases, the measures may form part of the proposal, be modest in scope or so plainly and easily achievable that it will be possible to reach a conclusion that there is no likelihood of significant environmental effects. The planning authority must have regard to the information provided by the applicant and should interpret this in both light of the precautionary principle and taking into account the degree of uncertainty in relation to the environmental impact, bearing in mind that there may be cases where the uncertainties are such that they need to be examined in the EIA.

5.24. In addition, enhancement measures may be incorporated into the design of the Development to maximise environmental benefits.

Residual Effects

5.25. Taking cognisance of the suggested mitigation (and enhancement) measures, the predicted effects will be re-assessed to determine the residual effects.

Cumulative Effects

5.26. At the time of writing it is known that there are other operational wind farms and a number of wind energy proposals located in the vicinity of the Site. Known wind farm developments are shown on Figure 3, Appendix A and listed in Appendix C. The methodology adopted for assessing the cumulative effects of wind energy developments will be in accordance with advice from SNH[4]. Cumulative effects will be considered for each technical area assessed within the EIA and include two forms:

- Combined effects of two or more similar developments; and
- Combined effects within the Development.

5.27. The cumulative assessment will include descriptions of the effects in relation to proposed and upgraded transmission lines in the vicinity of the Development.

5.28. The extent of the cumulative assessment relative to each technical assessment will be agreed during the consultation process. For example, the potential landscape and visual effects, which relate to the visibility of the Development, will be much more wide ranging than noise effects, which will be limited to receptors in the more immediate vicinity of the Development. Specific guidance and policy exist for certain technical areas which advise how effects should be considered cumulatively and these will be used where relevant.

5.29. Further details about the existing cumulative situation is provided in Section 22.

Alternatives

5.30. Schedule 4, Part 2 of the EIA Regulations requires a description of the reasonable alternatives (such as project design, technology, location, size and scale) studied by the developer, which are relevant to the Development and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of environmental effects.

5.31. Consideration of alternative designs has already begun. The final layout of the Development will be based on a range of technical criteria, such as

[4] SNH, 2012, *Assessing the Cumulative Impact of Onshore Renewable Energy Developments*. Available at: https://www.nature.scot/sites/default/files/2017-09/Guidance%20note%20%20-%20Assessing%20the%20cumulative%20impact%20of%20onshore%20wind%20energy%20developments.pdf [Accessed 09/04/2019]

separation distances between turbines, wind speed, prevailing wind direction, existing infrastructure, topography, ground conditions, local environmental issues and landscape and visual considerations.

5.32. The identification of these criteria is an iterative process: as they are identified the layout of the Development, including ancillary infrastructure, will undergo a series of modifications to avoid or reduce potential effects through careful design. This process will be set out in the EIA Report.

Structure and Content of the EIA Report

5.33. The content of the EIA Report will broadly follow the specifications detailed within Schedule 4 of the EIA Regulations. The EIA Report will consist of three volumes and a Non-Technical Summary (NTS).

- Volume 1 – Main EIA Report text;
- Volume 2 – Figures;
- Volume 3 – Landscape Visualisation and Viewpoint Pack; and
- Volume 4 – Technical appendices.

5.34. The front end of the main EIA Report text will include:

- An introduction;
- Description of the site and its surroundings;
- Details of alternative considered and scheme evolution;
- Description of the Development;
- Details of the EIA process and methodology, including a summary of consultation; and
- Policy context.

5.35. The technical chapters of the EIA Report will present details of the assessments undertaken, including any cumulative effects, required mitigation and residual effects.

6. PLANNING AND ENERGY POLICY

6.1. The Planning and Energy Policy Chapter of the EIA Report will consider the Development in the context of adopted and emerging planning and energy related documents. The EIA Report Chapter will not undertake a detailed assessment of the Development against relevant planning polices and other material considerations, rather it will identify those documents considered to be material to determination of the application, identifying and briefly discussing individual plans, policies, aims and objectives considered to be particularly pertinent to the Development.

6.2. The application will be accompanied by a Planning Statement in support of the Development. The Planning Statement will draw upon the contents of the Planning and Energy Policy Chapter and consider the Development against identified planning and other policy objectives, concluding with substantiated comments about the extent to which the Development complies with the aims and objectives of identified plans and policies.

6.3. For clarity, the Planning Statement will draw upon the post-mitigation residual effects of the Development, as identified in the various technical chapters of the EIA Report. The Planning Statement will include a discussion as to the extent to which it complies with the aims and objectives of identified planning, energy and other relevant policy objectives. The purpose of this Chapter of the Scoping Report is to establish agreement on the planning and energy related documents that should be considered by the Applicant in the EIA.

National Planning Policy

National Planning Framework 3

6.4. The Third National Planning Framework (NPF3) for Scotland sets the overall context for development planning across the country and provides a framework for the spatial development of Scotland as a whole. NPF3 was introduced in June 2014 and represents an up to date expression of Scottish Government policy on land use matters. NPF3 sets out the Scottish Government's development priorities over the next 20 to 30 years and identifies national developments which support the development strategy. NPF3 is a material consideration in the determination of planning applications.

6.5. The Planning and Energy Policy Chapter will identify those elements of NPF3 considered relevant to determination of the Development. While Section 3 of NPF3 'A low carbon place' is likely to contain material of most relevance to the Development, other sections of NPF3, notably Section 2 'A successful, sustainable place' and Section 4 'A natural, resilient place' will also contain relevant commentary, and the Planning and Energy Policy Chapter will identify and discuss these matters, as appropriate.

Scottish Planning Policy

6.6. The most up to date version of Scottish Planning Policy (SPP) was introduced by the Scottish Government in June 2014 alongside NPF3. SPP states that its purpose "*is to set out national planning polices which reflect Scottish Ministers' priorities for operation of the planning system and for the development and use of land*". As a statement of Scottish Ministers' priorities, the content of SPP is a material consideration that carries significant weight in the assessment of planning applications, although SPP makes it clear that it is for the decision maker to determine the appropriate weight in each case.

6.7. The subject policies contained in SPP mirrors the structure of the NPF3 and are set out under the following headings:

- A Successful, Sustainable Place;
- A Low Carbon Place;
- A Natural, Resilient Place; and
- A Connected Place.

6.8. The narrative and policies under the 'Low Carbon Place' heading are likely to be of most relevance to the Development, as this section contains commentary relating to renewable energy matters in general and in relation to onshore wind in particular. Table 1 of SPP 'Spatial Frameworks' shows areas where wind farms will not be acceptable (Group 1), areas of significant protection (Group 2), and areas with potential for wind farm development (Group 3). The Site is located within a Group 3 area.

6.9. The Planning and Energy Policy Chapter will consider the Development in the context of the Spatial Framework and other relevant commentary in SPP, including aims and objectives regarding the creation of a low carbon economy, the presumption in favour of development that creates sustainable development, and other relevant matters relating to rural development.

Onshore Wind Turbines, Online Renewables Planning Advice (May 2014)

6.10. The Scottish Government introduced online renewables advice in February 2011, which has been updated since then. The most recent specific advice note regarding onshore wind turbines was published in May 2014. The advice note identifies the typical planning considerations in determining applications for onshore wind turbines, including landscape impact, impacts on wildlife and ecology, shadow flicker, noise, ice throw, aviation, road traffic impacts, cumulative impacts and decommissioning.

6.11. The Planning and Energy Policy Chapter will consider the most up to date version of the advice note in place at the time of preparation.

Planning Advice Notes

6.12. Alongside NPF3 and SPP, the Scottish Government provides technical advice on specific land use planning matters through a series of Planning

Advice Notes (PANs). A number of PANs are potentially relevant to the Development and these would be briefly discussed in the Planning and Energy Policy Chapter, with more detailed commentary reserved for the relevant technical chapters. At this stage, it is envisaged that the following PANs may be of relevance:

- PAN 1/2011: Planning and Noise (2011);
- PAN 1/2013: Environmental Impact Assessment, Revision 1.0 (2017);
- PAN 2/2011: Planning and Archaeology (2011);
- PAN 3/2010: Planning Advice on Community Engagement (2010);
- PAN 51: Planning, Environmental Protection and Regulation (2006);
- PAN 60: Planning for Natural Heritage (2000);
- PAN 61: Planning and Sustainable Urban Drainage Systems (2001);
- PAN 68: Design Statements (2003);
- PAN 69: Planning and Building Standards Advice on Flooding (2004);
- PAN 75: Planning for Transport (2005); and
- PAN 79: Water and Drainage (2006).

Historic Environment Policy for Scotland (May 2019)

6.13. The Historic Environment Policy for Scotland (HEPS) sets out policies for the historic environment, provides greater policy direction for HES, and provides a policy framework to inform the work of organisations that have a role and interest in managing the historic environment. HEPS is a material consideration which should be taken account of whenever a planning decision will affect the historic environment. Pages 10 and 11 illustrate the challenges and opportunities facing the historic environment including climate change and the effort required to mitigate and adapt to its effects.

6.14. The Planning and Energy Policy Chapter will consider the Development against HEPS, notably the 'Policies and Principles' which include conservation and management of change for the benefit of present and future generations. HEPS recognises that changes in society, climate change and economy can create challenges for the historic environment requiring that resources are managed sustainably to balance competing demands.

Strategic and Local Planning Policy

Highland-wide Local Development Plan, Caithness and Sutherland Local Development Plan and Onshore Wind Supplementary Guidance

6.15. The Development Plan covering the Site is the Highland−wide Local Development Plan (adopted 2012) (HwLDP) and the Caithness and Sutherland Local Development Plan (adopted 2018) (CaSPlan). Onshore Wind Supplementary Guidance adopted in 2016 also forms part of the Development Plan documents.

6.16. A review of the HwLDP commenced in 2015 and consultation was held on the Main Issues Report to inform the first stage of the replacement HwLDP process. The review was postponed during 2017 when the Council confirmed their intention to wait until the implications of the Scottish Government's ongoing review of the planning system has become clearer. There is no update at time of writing as to when the review may recommence; therefore, it is expected that the currently adopted HwLDP will provide the established planning policy throughout the EIA Report preparation stage and the determination period for the Development. Progress of the HwLDP review will be monitored throughout the EIA, and if appropriate, the Planning and Energy Policy Chapter will contain a section that discusses relevant progress.

6.17. The HwLDP will be the main tool in the decision making process for The Highland Council, and the Planning and Energy Policy Chapter will identify those aims, objectives and planning policies of the HwLDP considered relevant to the Development. Policy 67 of the HwLDP is the principal policy relating to renewable energy development; however, other policies of the HwLDP will also be discussed as appropriate within the context of the EIA. The CaSPlan also contains commentary on the relevance of renewable energy development for the Highlands, and this will be incorporated also in the Planning and Energy Policy Chapter.

6.18. The Highland Council adopted their Onshore Wind Supplementary Guidance in 2016, which also forms part of the Development Plan and is afforded the same weight as the Local Development Plan documents for decision making purposes. An Addendum Supplementary Guidance: 'Part 2b' was adopted in 2017 and looks at six geographical areas in relation to the potential for wind energy development. Caithness forms one of these areas. The Planning and Energy Policy Chapter will identify the relevant sections of both parts of the Supplementary Guidance.

Energy Policy

6.19. According to the United Nations Intergovernmental Panel on Climate Change's fifth assessment report, fossil fuel power generation should be phased out 'almost entirely' by the end of the century to limit global warming to 2 degrees Celsius (°C) above pre-industrial levels. The report states that low carbon electricity supply will have to increase from 30% currently to more than 80% by 2050[5].

6.20. Most of the energy policy documents of relevance to the Development are concerned with reducing the amount of greenhouse gases (GHG) that are emitted as a result of energy production with a related objective of increasing the proportion of energy derived from renewable sources. The Planning and Energy Policy Chapter will identify and discuss the key aims and objectives of the most pertinent energy policy documents to the Development, at the time of EIA Report preparation. The discussion will

[5] IPCC (2014) IPCC Fifth Assessment Synthesis Report: CLIMATE CHANGE 2014 SYNTHESIS REPORT Longer report, Adopted 1November 2014. Available online at: http://www.ipcc.ch/pdf/assessment-report/ar5/syr/SYR_AR5_LONGERREPORT.pdf (Page SYR-51)

include relevant European, United Kingdom (UK) and Scottish energy related legislation and policy. It is anticipated that the commentary on energy policy will identify and discuss the following publications:-

- 2009 Copenhagen Accord[6] - As a party to the Copenhagen Accord, the UK has agreed a range of proclamations and objectives, including that climate change is 'one of the greatest challenges of our time', which must be combated 'urgently'.
- 2009 European Renewable Energy Directive[7] - The Directive encourages energy efficiency, energy consumption from renewable sources and the improvement of energy supply.
- The Climate Change (Scotland) Act 2009[8] - Sets out the statutory framework for GHG emission reductions in Scotland. The Scottish Government published its updated Climate Change Plan in February 2018, setting out proposals to drive emissions down by 66% by 2032[9].
- Renewables Action Plan (2009)[10] including associated updates – The overall aim is to support and accelerate the implementation of renewable energy in line with EU targets.
- Onshore Wind Policy Statement (December 2017)[11] - This published statement by the Scottish Government examines a number of issues relating to the maintenance and continued support of onshore wind as a more mature technology for renewable energy generation. The statement covers a range of topics including route to market, strategic approach to development, protection for residents and the environment and community benefits.
- Scottish Energy Strategy: The future of energy in Scotland (December 2017)[12] - This strategy document aims to guide Scottish Government decisions and priorities in the context of a 'whole system' approach to energy production and consumption. Two new 2030 targets are set by the strategy. Firstly, that the equivalent of 50% of the energy for Scotland's heat, transport and electricity consumption to be supplied from renewable sources. Secondly, an increase in 30% in the productivity of energy use across the Scottish economy.
- Electricity Generation Policy Statement, 2013[13] - This Scottish Government publication examines the way in which Scotland generates electricity and is underpinned by 4 key principles, one of which includes a largely decarbonised electricity generation sector by 2030.

6.21. These documents comprise the main energy related publications that will be considered in the Planning and Energy Policy Chapter of the EIA Report, with any other publications and/or updates to these documents considered on a case by case basis.

[6] United Nations Framework Convention on Climate Change (2009) – *The Copenhagen Accord*
[7] European Union (2009), The Renewables Directive, 2009/28/EC
[8] Scottish Government (2009), Climate Change (Scotland) Act 2009
[9] Scottish Government (2018), Climate Change Plan: third report on proposals and policies 2018-2032
[10] Scottish Government (2009), *Renewables Action Plan*
[11] Scottish Government (2017), Onshore Wind Policy Statement
[12] Scottish Government (2017), Scottish Energy Strategy; The future of energy in Scotland
[13] Scottish Government (2013), Electricity Generation Policy Statement – 2013.

7. FORESTRY

7.1. This Chapter of the Scoping Report sets out the approach which would be used to integrate the Development into the existing woodland structure. A Wind Farm Forest Plan would be prepared, which would detail felling and replanting proposals, illustrating the forestry requirements associated with the construction and operation of the Development.

7.2. The Site is largely forested, with the remainder comprising open ground for management boundaries, unplantable land and margins beyond the woodland edge. The forest within the Site is privately owned and managed and consists primarily of commercial conifers with areas of native broadleaves, open ground habitats, and water bodies.

7.3. A desk-based assessment reveals there are no woodland designations affecting the Site. Small areas are located within the Secondary Zone under the Native Woodland Integrated Habitat Network, as potential areas for native woodland expansion. The associated core areas of the Native Woodland Integrated Habitat Network and Primary Zones for native woodland expansion are located outwith the Site.

Assessment Methodology

Guidance and Legislation

7.4. In the UK, there is a strong presumption against permanent woodland removal, unless it addresses other environmental concerns or where it would achieve significant and clearly defined additional public benefits. In Scotland, such woodland removal is dealt with under the Scottish Government's Control of Woodland Removal Policy[14] (2009). The purpose of the policy is to provide direction for decisions on woodland removal in Scotland. It is essential that the requirements of the Policy are addressed within the EIA.

7.5. The forestry proposals would be prepared in accordance with the current industry best practice and guidance including, but not limited to:

- Forestry Commission (2017). The UK Forestry Standard: The Government's Approach to Sustainable Forestry, Forestry Commission. Edinburgh;
- Forestry Commission Scotland (2009). The Scottish Government's Policy on Control of Woodland Removal. Edinburgh;
- Forestry Commission Scotland (2015): Guidance to Forestry Commission Scotland staff on implementing the Scottish Government's Policy on Control of Woodland Removal;
- The Highland Council (2006). Highland Forest & Woodland Strategy. Inverness;
- The Highland Council (2013). Supplementary Guidance: Trees, Woodlands and Development. Inverness;

[14] FCS (2009). Control of Woodland Removal Policy. Available at: Control of Woodland Removal Policy [Accessed 01/03/2018]

- The Scottish Government (2019). Scotland's Forestry Strategy 2019–2029. Edinburgh;
- The Scottish Government (2011). Scottish Land Use Strategy. Edinburgh;
- The Scottish Government (2012): Waste (Scotland) Regulations 2012;
- The Scottish Government (2014a). Scotland's Third National Planning Framework (NPF3). Edinburgh;
- The Scottish Government (2014b). Scottish Planning Policy. Edinburgh;
- SEPA (2013): SEPA Guidance Notes WST-G-027 Management of Forestry Waste;
- SEPA (2014): LUPS-GU27 Use of Trees Cleared to Facilitate Development of Afforested Land; and
- UKWAS (2018). The UK Woodland Assurance Standard 4th Edition, UKWAS, Edinburgh.

Consultation

7.6. The main forestry consultee is Scottish Forestry who would be consulted throughout the design of the Development to ensure that the proposed changes to the woodlands are appropriate and address the requirements of the Control of Woodland Removal Policy and other guidance. In addition, there may be interrelated issues raised by other consultees which would be addressed within the forestry assessment, for example from SEPA on forestry residues and the Council on timber transport.

Assessment

7.7. Forestry does not fit well into the standard EIA methodology. Commercial forests are dynamic and constantly changing through landowner activities, market forces and natural events such as windblow or pest and diseases. The forestry assessment would therefore not be a formal EIA assessment, rather it would be an assessment which describes the changes to the forest structure resulting from the incorporation of the Development into the forest. This would include the changes to, for example, the woodland composition and felling programmes. The forestry assessment would be presented in an individual EIA Report Chapter. The effects of the Development relating to forest felling and restocking would be assessed in the relevant chapters of the EIA Report, including Ecology; Landscape and Visual; Hydrology, Hydrogeology, Geology and Peat; Ornithology; and Traffic and Transport.

Baseline Conditions

7.8. The forestry baseline will describe the crops existing at the time of preparation of the EIA Report. This would include current species; planting year; felling and restocking plans contained within the existing Forest Plan; and other relevant woodland information. It would be prepared from

existing forest records; desk-based assessments; site visits; and aerial photographs.

Potential Effects and Assessment

7.9. There is potential for changes to the forest structure resulting from the Development, with consequential implications for the wider felling and restocking plans across the forest area. Areas of woodland may need to be felled for the construction and operation of the Development including for access tracks, turbine locations and other infrastructure. The potential effects would be changes to the structure of the woodlands, which may result in a loss of woodland area. This would be addressed through a redesign of the existing forest including, for example, the use of designed open space; alternative woodland types; changing the management intensity; or the provision of compensation planting on an alternative site. The changes to the forests for a particular development are regarded as site specific, and there are no cumulative forestry issues to be addressed.

7.10. The principal output would be the preparation of the Wind Farm Forest Plan. This would include a felling plan to show which woodlands are to be felled and when they are to be felled during the life of the Development. It would further include a restocking plan showing which woodlands are to be replanted and when during the life of the Development. The changes to the woodland structure would be analysed and described including changes to species composition, age class structure, timber production, traffic movements and the felling and restocking plans.

7.11. The resulting changes to the woodland structure and any requirement for compensation planting to mitigate against any woodland loss would be considered in the context of the Control of Woodland Removal Policy and in consultation with FCS.

Key Questions for Consultees

7.12. The following questions have been designed to ensure that the proposed methodologies and assessment are carried out in a robust manner and to the satisfaction of the determining authorities:

- Do the consultees agree with the proposed methodology and scope of the forestry assessment?
- Do the consultees have any information, particularly with reference to any new guidance, which should be taken into account within the assessment?

8. LANDSCAPE AND VISUAL

Introduction

8.1. It is acknowledged from the outset that, in common with almost all commercial wind energy developments, some landscape and visual effects would occur as a result of the proposals.

8.2. A key principle of the European Landscape Convention is that all landscapes matter and should be managed appropriately. It is also acknowledged that landscapes provide the surroundings for people's daily lives and often contribute positively to the quality of life and economic performance of an area.

8.3. It is therefore proposed that a Landscape and Visual Impact Assessment (LVIA) is undertaken as part of the EIA and an LVIA Chapter be included in the EIA Report. The LVIA will be undertaken by Chartered Landscape Architects, who are experienced in the assessment of large scale, onshore wind energy projects and are fully familiar with the landscape in and around Caithness.

8.4. It is proposed that the LVIA will consider the potential effects of the Development upon:

- Individual landscape features and elements;
- Landscape character; and
- Visual amenity and the people who view the landscape.

Study Area

8.5. In order to assist with defining the study area, a digital Zone of Theoretical Visibility (ZTV) model is created as a starting point to illustrate the geographical area within which views of the Development are theoretically possible. This is based on a 'bare-earth' scenario, whereby the screening effect of areas of existing vegetation or built features in the landscape are not taken into account. The ZTV is modelled to blade tip height using the currently proposed turbine height of 138.5 m and is presented at Figure 5, Appendix A.

8.6. The ZTV is a useful tool used to provide a focus on the area and receptors that are most likely to be affected by a proposed development but should always be subject to verification in the field. In this regard, initial site visits have been conducted during April 2019 to understand the actual likely visibility of the Development and the Site.

8.7. Having reviewed the ZTV and with regard to best practice guidance, the LVIA will consider an initial 35 km radius study area. Detailed assessment will then be provided for a 15 km section of this study area, represents a proportionate extent of the study area and the limit within which any potential significant effects might occur.

8.8. For the cumulative assessment, consideration was initially given to a 60 km radius from the Site, as recommended by SNH best practice guidance. Following this review, it is proposed that a 20 km detailed study area be adopted to consider cumulative effects, which represents a proportionate extent of the study area and the limit within which any potential significant cumulative effects might occur. Cumulative sites within 20 km of the site are illustrated on Figure 3, Appendix A and listed in Appendix C.

8.9. It is also proposed to carry out a separate Residential Visual Amenity Assessment covering all properties located within 2 km of all proposed turbines. This additional assessment will be presented in an appendix to the LVIA Chapter and will complement the assessment of visual receptors within the LVIA, providing further detail in relation to the effect on the views and amenity from different parts of each property and its curtilage.

Assessment Methodology

8.10. It is proposed that the main objectives of the LVIA will be as follows:

- To identify, evaluate and describe the current landscape character of the Site and its surroundings, and also any notable individual or groups of landscape features within the Site;
- To determine the sensitivity of the landscape to the type of development proposed;
- To identify potential visual receptors (i.e. people that would be able to see the Development) and evaluate their sensitivity to the type of changes proposed;
- To identify and describe any impacts of the Development in so far as they affect the landscape and/or views of it and evaluate the magnitude of change due to these impacts;
- To identify and describe any mitigation measures (including mitigation which is inherent in the design and layout of the Development) that have been adopted to avoid, reduce and compensate for landscape and visual effects;
- To identify and assess any cumulative landscape and visual effects;
- To evaluate the level of residual landscape and visual effects; and
- To make a professional judgement about which effects, if any, are significant.

Published LVIA Guidance

8.11. The LVIA shall be undertaken in accordance with the principles of best practice, as outlined in published guidance documents, notably the third edition of the Guidelines for Landscape and Visual Assessment (GLVIA3)[15].

[15] Landscape Institute and the Institute for Environmental Management and Assessment, 2013

8.12. The methodology and assessment criteria proposed for the assessment has been developed in accordance with the principles established in this best practice document. It should be acknowledged that GLVIA3 establishes guidelines, not a specific methodology. The preface to GLVIA3 states:

"This edition concentrates on principles and processes. It does not provide a detailed or formulaic 'recipe' that can be followed in every situation – it remains the responsibility of the professional to ensure that the approach and methodology adopted are appropriate to the task in hand."

8.13. The approach has therefore been developed specifically for this assessment to ensure that the methodology is fit for purpose.

8.14. As part of the development of the proposed methodology, consideration has also been given to the following documents:

- Guidelines for Landscape Character Assessment, (2002) Countryside Agency and SNH;
- Landscape Character Assessment Guidance for England and Scotland: Topic Paper 6: Techniques and Criteria for Judging Capacity and Sensitivity, (2002) The Countryside Agency and SNH;
- Assessing the Cumulative Impact of Onshore Wind Energy Developments (March 2012) SNH;
- Siting and Design of Wind farms in the Landscape, Version 3 (February 2017) SNH;
- Visual Representation of Wind farms – Version 2.2 (February 2017), SNH;
- Visualisation Standards for Wind Energy Developments (July 2016), Highland Council;
- LI Advice Note 02/17 Visual representation of development proposals (March 2017) Landscape Institute;
- LI Advice Note 02/19 Residential Visual Amenity Assessment (RVAA) (March 2019) Landscape Institute; and
- LI Advice Note 01/11 Photography and Photomontage in Landscape and Visual Impact Assessment, (2011) Landscape Institute.

8.15. Full details of the methodology will be provided within the LVIA chapter of the EIA Report. The following provides an outline of the key aspects of the assessment.

Distinction between Landscape and Visual Effects

8.16. In accordance with the published guidance, landscape and visual effects shall be assessed separately, although the procedure for assessing each of these is closely linked. A clear distinction has been drawn between landscape and visual effects as described below:

- Landscape effects relate to the effects of the Development on the physical and perceptual characteristics of the landscape and its resulting character and quality; and

- Visual effects relate to the effects on specific views experienced by visual receptors and on visual amenity more generally.

Types of Landscape and Visual Impacts Considered

8.17. The LVIA will address all phases of the Development and effects will be considered during the construction phase, when the Development is being built (temporary effects), following completion of the Development (permanent effects) and during decommissioning at the end of the project (temporary effects).

8.18. The LVIA will not only assess the impacts associated with the turbines, but also any related impacts resulting from any anemometer masts, control building/substation, underground cabling, site tracks and access roads.

8.19. Consideration shall be given to seasonal variations in the visibility of the Development and these will be described where necessary.

8.20. The LVIA will also consider the potential for any cumulative effects to arise. The requirement for consideration of cumulative effects under the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 is set out in Schedule 4, as follows:

'5. A description of the likely significant effects of the development on the environment resulting from, inter alia: *(e) the cumulation of effects with other existing and/or approved development, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources';*

8.21. This represents a change to the wording of the previous Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2010 which stated*: 'A description of the likely significant effects of the development on the environment, which should cover the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the development'.*

8.22. There is therefore no longer any requirement under the current EIA Regulations to consider the potential for cumulative impacts in relation to other developments which are yet to be awarded consent.

8.23. Notwithstanding this, it is acknowledged that current best practice guidance for cumulative impact assessment (Assessing the Cumulative Impact of Onshore Wind Energy Developments, SNH, 2012) still refers to a consideration of proposals which are *'awaiting determination within the planning process with design information in the public domain'* and states that *'The decision as to which proposals in the planning / consenting system should be included in an assessment is the responsibility of the determining authority.'*

8.24. As such, it is proposed in this LVIA to consider cumulative effects caused by the Development in conjunction with other sites which are either

operational, under construction, consented or the subject of a full planning application. The SNH best practice guidelines identify two principle types of cumulative visual impact:

- Combined visibility – where the observer is able to see two or more developments from one viewpoint; and
- Sequential visibility – where two or more sites are not visible at one location but would be seen as the observer moves along a linear route, for example, a road or public right of way.

8.25. The guidelines state that 'combined visibility' may either be 'in combination' (where two or more sites are visible from a fixed viewpoint in the same arc of view) or 'in succession' (where two or more sites are visible from a fixed viewpoint, but the observer is required to turn to see the different sites). Each of the above types of cumulative effect will be considered in the LVIA.

Proposed LVIA Viewpoint Locations

8.26. It is proposed that the 13 locations set out in Table 8.1 are included as viewpoints in the LVIA. The locations which are illustrated on Figure 5, Appendix A represent visual receptors and character types at a range of distances and directions from the Site.

8.27. It is acknowledged that the Development is located immediately north and east of the Halsary Wind Farm site. This scheme of 15 no. turbines, was originally granted consent for turbines 100 m to blade tip, which was then revised to 112 m turbines and then most recently 120 m turbines. The Halsary Wind Farm in turn lies within a cluster of wind farms which includes the Achlachan I and II Wind Farms (115 and 110 m to blade tip), the Bad a Cheo Wind Farm (112 m to blade tip) and the Causeymire Wind Farm (101 m to blade tip).

8.28. A comparative exercise of ZTV coverage between the Development and the turbines in the remainder of the cluster has been undertaken to understand the potential cumulative effects of the Development in combination with the other schemes. This in turn has influenced the choice of viewpoint locations, which have been purposefully chosen to replicate those that were included in the Addendum to the LVIA which was submitted with the application to vary the Halsary scheme to 120 m turbines.

8.29. Although there are minor differences in ZTV coverage between the Development and the other schemes in the cluster; the following focussed list of 13 viewpoints are considered to remain relevant for a consideration of the potential significant visual effects arising from the Development.

Table 8.1: Proposed Assessment Viewpoints

No	Location	OS Grid Ref	Direction	Receptor Type
1	A9, Memorial	317323, 948527	South	Road Users
2	North Wick, A99	335974, 951939	East	Residents/ Road Users
3	Halkirk, south end	313240, 958821	North-west	Residents/ Road Users
4	Loch of Yarrows Archaeological Trail	330455, 943218	South-east	Recreational
5	A9 Spittal	316880, 953716	North-west	Residents/ Road Users
6	Ben Dorrery	306304, 955053	North-west	Recreational
7	Westerdale	312693, 951475	West	Residents/ Road Users
8	Ben Aisky	304603, 938657	South-west	Recreational
9	The Grey Cairns of Camster	326166, 944101	South-east	Recreational/ Road Users
10	A882, east of Watten	326868, 953618	East	Road Users
11	First view north from A9 south	317633, 945136	South	Road Users
12	North of Hoy on B876	321653, 964992	North	Road Users
13	Minor road north of Grey Cairns of Camster	324210, 948422	South-east	Residents/ Road Users

8.30. Each of the representative viewpoints will be visited to evaluate the sensitivity of views. In addition, the study area will also be extensively visited to consider visibility of the Development as receptors move through the landscape.

8.31. The viewpoints will be used as the basis for determining the effects on visual receptors within the study area. The sensitivity of different receptor groups will be set out in the LVIA methodology.

8.32. The level of effect experienced by different visual receptor groups will be determined by considering in tandem the sensitivity and view with the magnitude of impact.

Visualisations

8.33. For each of the viewpoints, visualisations will be prepared in line with Visualisation Standards for Wind Energy Developments (July 2016), Highland Council. There are however a number of matters relating to the visualisations which we would be grateful for further clarification on the approach to be taken. These are set out in the Key Questions section below.

Baseline Conditions

Landscape Character

8.34. The Caithness and Sutherland landscape assessment was undertaken by Land Use Consultants in 1998 and formed part of the national programme of landscape character assessment (LCA) commissioned by Scottish Natural Heritage (SNH) in partnership with local authorities.

8.35. The study defines fifteen landscape character types across Caithness and Sutherland. Two of the character types are further sub-divided into landscape sub-types. In addition, several large areas of coniferous woodland are also identified separate to the landscape character types.

8.36. The Site lies within one such area of coniferous woodland. Other local character types include: '1 - Sweeping Moorland'; '1a – Flat Peatland'; '14 – Mixed agriculture and settlement'; and '15c – Fringe crofting and historic features'.

8.37. More recently, the 'Highland Council Onshore Wind Energy Supplementary Guidance', November 2016, identified a series of Landscape Character Areas within Caithness. This site lies within 'CT9: North Caithness', which is described as an area of 'Farmed Lowland Plain', an *'Extensive landscape character type, extending across the north east of Caithness running between Wick to the east, and from Tang Head to Melvich along the north'*.

8.38. The analysis of the 'Landscape Sensitivity' of the CT9 Area identified a score of '1' for Large Scale Wind Farm development (on a scale of 1-4, with 1 being the most susceptible to change).

8.39. However, it is not considered that the landscape of the Site fully conforms to the identified characteristics of the CT9 Area, which does not acknowledge the large area of coniferous woodland in which the site is located, in the manner which the earlier SNH study had done. Similarly, there is no acknowledgment of the existing and consented wind energy development in the cluster adjacent to the site, and the role this may have in defining the character of the area.

8.40. The LVIA will include an assessment of the sensitivity of the local landscape character and how this might differ from the description in the Onshore Wind Energy Supplementary Guidance.

Landscape Designations

8.41. The Site lies outwith any identified landscape designations, including, National Parks, National Scenic Areas, Special Landscape Areas. It also lies outwith Wild Land, Listed Gardens and Designed Landscapes. Landscape designations in the wider area are illustrated on Figure 4, Appendix A.

Visual Receptors

8.42. There are few settlements and towns in the nearby locality surrounding the Site, albeit there are a number of individual residential properties, which are considered separately below. There would be the potential for some views from the local road network, including the A9; A882; B870; and B874, as well as from the railway which runs between Wick, Thurso and south to Inverness. A detailed consideration of the potential for impacts to the visual amenity of receptors in the landscape surrounding the Site will be set out in the LVIA. This visual assessment will be informed by a selection of representative assessment viewpoints, which are discussed further in the methodology section, each of which will be illustrated with visualisations prepared in line with Highland Council[16] and SNH best practice guidance[17].

Residential Visual Amenity

8.43. A detailed consideration with regard to residential visual amenity will also be given within in the LVIA. The Residential Visual Amenity Study (RVAS) will consider views from all properties located within 2 km of the Development.

Potential Effects and Assessment

Scoped In Effects

- Effects on Landscape Features;
- Effects on Landscape Character - with an initial study area of 35km and a detailed assessment area of up to 15km;
- Effects on Visual Amenity - with an initial study area of 35km and a detailed assessment area of up to 15km;
- Effects on Landscape Designations - with an initial study area of 35km and a detailed assessment area of up to 15km;
- Cumulative Effects on Landscape Character and Visual Amenity – with a detailed assessment area of up to 20km

[16] THC (2016) Visualisation Standards for Wind Energy Developments (July 2016)
[17] SNH (2017) Visual Representation of Wind farms – Version 2.2 (February 2017)

Scoped Out Effects

- Effects on Landscape Character - beyond the detailed assessment area of up to 15km;
- Effects on Visual Amenity - beyond the detailed assessment area of up to 15km;
- Effects on Landscape Designations - beyond the detailed assessment area of up to 15km; and
- Cumulative Effects on Landscape Character and Visual Amenity – beyond the detailed assessment area of up to 20km.

Key Questions for Council / Consultees

8.44. The following are what are thought to be the key issues which require consideration by the consultees:

- Are there any comments with regard to the position taken that the landscape of the of the Site does not fully conform to the identified characteristics and sensitivity of the CT9 Area, as its description does not acknowledge the large area of coniferous woodland in which the site is located (in the manner which the earlier SNH study had done), and due to the proximity of the existing and consented wind energy development in the adjoining cluster?
- Are there any comments on the proposed list of viewpoint locations?
- Are there any further wind farm sites, to those listed in Appendix C, to consider as part of the cumulative assessment?
- It is noted that within 'Visualisation Standards for Wind Energy Developments (July 2016)' the need to provide 'monochrome' images (a black and white photo with red turbines) is set out to be 'if required' by Highland Council. Can Highland Council provide confirmation for which viewpoints, if any, this will be required?
- It is also noted that there is also a requirement within 'Visualisation Standards for Wind Energy Developments (July 2016)' for any existing cumulative turbines in the view to be digitally removed and re-photomontaged back into the photograph so that they are orientated to face towards the viewer. Can Highland Council confirm if this will be required if the turbines are already orientated to face towards the viewer in the baseline photograph?

9. ECOLOGY

Introduction

9.1. This Section sets out the approach to the evaluation of the ecological interests of the Site and surrounding area as well as the approach to the assessment of potential impacts on ecology throughout the construction, operation and decommissioning phases of the Development.

Assessment Methodology

9.2. The assessment of ecological impacts will follow the guidance document produced by the Chartered Institute of Ecology and Environmental Management (CIEEM) ensuring a transparent and scientifically rigorous approach to Ecological Impact Assessment (EcIA)[18]. These guidelines set out the process for assessment through the following:

- Collation of baseline ecological information through desk study and field surveys (see Baseline Conditions and Baseline Survey Methodology below);
- Identification and characterisation of Important Ecological Features (IEFs);
- Incorporation of embedded mitigation measures such as mitigation by design and mitigation by practice;
- Identification and characterisation of ecological impacts from all phases of the Development;
- Assessment of significance of effects ahead of and following the application of mitigation hierarchy;
- Incorporation of measures to mitigate identified potential effects;
- Assessment of significance of cumulative effects;
- Identification of appropriate compensation to offset significant residual impacts; and,
- Identification of opportunities for ecological enhancement.

Determining Importance

9.3. Upon identification of the likely effects a systematic assessment of IEFs will be carried out. In accordance with CIEEM guidance, the importance of an ecological feature is considered within a defined geographical context.

9.4. The determination will be site specific; however, habitats and species of nature conservation importance identified through statutory policy and legislation will provide a starting point for the identification of IEFs requiring consideration in EcIA. Expert judgment is also required for the identification of IEFs, particularly where these may not be included in lists, designated sites or features, or highlighted in nature conservation policy.

[18] CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine.

Only ecological features with at least regional importance are considered as IEFs and will require assessment for potential significant effects. All other features are scoped out of the assessment with justification for their exclusion provided within the EIA Report.

Assessment of Significance

9.5. Within this assessment, the significance of the potential effects on each identified IEF is determined by considering both the nature conservation importance of each feature and the degree to which it may be affected (the effect magnitude) by the Development as well as consideration of embedded mitigation.

9.6. For the purpose of this assessment, an effect determined to be significant at international, national or regional level, is considered to be a 'significant effect'. An effect determined to be significant at a local or less that local level will be considered to be 'non-significant effect.

Mitigation, Residual Effects and Cumulative Effects

9.7. The assessment will include proposals to mitigate potentially adverse effects and will include measures to increase biodiversity in the area where possible, such as habitat restoration and management. Mitigation will be identified where the assessment indicates that there is a potential significant impact on important habitats and species as a consequence of the Development. Following the application of mitigation, an assessment of residual effects will be carried out to determine whether effects remain 'significant'. Potential cumulative ecological effects with other nearby developments will also be addressed.

Baseline Conditions

Statutory Designated Sites

9.8. The following statutory sites designated for ecological features within 5 km of the Site were identified using the SNH 'Sitelink' website[19]:

- Sites of European importance:
  - Special Areas Conservation (SACs);
  - Ramsar Sites; and
- Sites of national importance:
  - Sites of Special Scientific Interest (SSSIs).

9.9. Three statutory sites of European importance and three sites of national importance were identified within 5 km of the Site. Information relating to these statutory sites is summarised in Table 9.1, with locations shown in Figure 6, Appendix A.

[19] SNH (2019) SNH Sitelink [Online] Available at: https://sitelink.nature.scot/home (Accessed 26/03/2019)

Table 9.1: Summary of Statutory Sites of International and National Importance, Designated for Ecological Interest

Site name	Designation	Qualifying Ecological Interests	Proximity to the Site
Sites of European Importance			
Caithness and Sutherland Peatlands	SAC	• Acid peat-stained lakes and ponds • Blanket bog • Clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels • Depressions on peat substrates • Marsh saxifrage (*Saxifraga hirculus*) • Otter (*Lutra lutra*) • Very wet mires often identified by an unstable 'quaking' surface • Wet heathland with cross-leaved heath	650 m south
	Ramsar site	• Blanket bog	
Loch Watten	SAC	• Naturally nutrient-rich lakes or lochs which are often dominated by pondweed	3.3 km north-east
River Thurso	SAC	• Atlantic salmon	3.8 km west
Sites of National Importance			
Sheilton Peatlands	SSSI	• Blanket bog	650 m south
Loch Watten	SSSI	• Base-rich loch Open water transition fen	3.3 km north-east
Blar nam Faoileag	SSSI	• Blanket bog	4.5 km south-west

Recent Ecological Records

9.10. A summary of publicly available biological records[20] is presented in Table 9.2 and includes recent records (within 20 years) of internationally and nationally protected species within 5 km of the Site as well as records of invasive, non-native species within 2 km of the Site.

Table 9.2: Recent Protected Species Records within 5 km of the Site.

Species	Conservation Value	Records
0-5 km from Site		
Otter (*Lutra lutra*)	European Protected Species[21]	1 record (2003) 2 records (2009) 5 records (2011) 2 records (2017)
Water vole (*Arvicola amphibius*)	Nationally Protected Species[22]	2 records (2005) 2 records (2007) 1 record (2008) 2 records (2009) 2 records (2013)
Pine Marten (*Martes martes*)	Nationally Protected Species	1 record (2009)

9.11. One public record of a hybrid domestic cat/wildcat (2016) and two public records of domestic cat (2011, 2014) were recorded within 5 km of the Site.

9.12. No non-native invasive species were recorded within 2 km of the Site.

Baseline Surveys Completed to Date

Wildcat Walkover Survey

9.13. A Wildcat Walkover Survey was carried out by Arcus Consultancy Services Ltd in February 2019, in accordance with SNH protected species survey guidelines[23] within and up to 200 m of the Site (Wildcat Survey Area). The aim of the survey was to record suitable habitats and the presence of foraging, hunting and denning wildcat as well as to inform the requirement for further detailed surveys, such as camera trapping.

[20] NBN Atlas occurrence download at https://nbnatlas.org accessed on Mon Apr 01 13:38:09 UTC 2019.
[21] Fully protected under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended).
[22] Protected Schedule 5 of the Wildlife and Countryside Act 1981 (as amended).
[23] SNH (n.d) Planning and Development: Protected Animals [Online] https://www.nature.scot/professional-advice/planning-and-development/natural-heritage-advice-planners-and-developers/planning-and-development-protected-animals (Accessed 25/03/2019)

9.14. Habitats recorded during the survey were assessed to be largely of low value to denning, hunting and commuting wildcat, primarily due to the dense, wet or water-logged nature of the conifer plantation, which constituted the majority of the Wildcat Survey Area. Small areas of moderately suitable foraging habitat consisting of mixed woodland bordered by pasture and moorland was present in the north-west of the Wildcat Survey Area, albeit largely outwith the boundary of the Site. However, these habitats were found to be limited in scale and largely fragmented.

9.15. Although some suitable denning features such as windblown trees were recorded, the wet nature of the surrounding habitat likely significantly reduces the potential for these features to be utilised by wildcat. Furthermore, disturbance from ongoing forestry, recreational activities such as fishing on Loch Toftingall, and nearby human settlements, are all likely to reduce the suitability of the habitat for wildcat, particular in regards to denning.

9.16. It is noted that the Site lies in nearby proximity to a camera trapping study area used in the University of Oxford Wildlife Conservation Research Unit (WildCru) study in to the species[24]. However, it is important to acknowledge this study area was selected on the basis of historical records, (one record from 1985 was recorded in the desk-based study[20]) and during the WildCru study, only a small number feral cats were recorded (5 cats over 1514 trapping nights), with no (feral/wildcat) hybrids or wildcats recorded.

9.17. In light of the low value of habitats and lack of field evidence of the species recorded during the wildcat survey, it is unlikely that wildcat would be denning with the Site or immediately surrounding area; therefore, no further wildcat surveys are recommended at this stage.

Baseline Survey Methodology

9.18. In addition to the baseline studies already carried out (above), collection of further baseline ecological data is proposed via the methods outlined below.

Detailed Desk Study

9.19. In order to augment baseline data collected and, if necessary, refine the survey scope, recent records (within 20 years) of protected and/or notable species and details of sites of ecological interest will be sought. Data consultation will aim to collect up-to-date records of the following: non-statutory designated sites located within 2 km of the Site, (extended to 5 km for those designated for bats); rare, notable or protected flora and fauna within 5 km of the Site (extended to 10 km for bats); and records of invasive, non-native species within 2 km of the Site.

[24] Kilshaw, K. et al (2015) "Mapping the spatial configuration of hybridization risk for an endangered population of the European wildcat (Felis silvestris silvestris) in Scotland". Mammal Research. November 2015

9.20. In the first instance, records will be sought from publicly available data resources, as well as, but not limited to, the following organisations:

- SNH;
- The Highland Council;
- Highland Biological Recording Group (DGERC);
- North Highland Bat Network;
- Botanical Society of Britain and Northern Ireland;
- Scottish Badgers;
- Scottish Wildlife Trust; and
- Caithness District Salmon Fishery Board.

Consultation

9.21. In addition to formal scoping, early and thorough consultation with key stakeholders is a key element in the assessment process. SNH will be engaged to discuss preliminary survey results and key constraints where necessary, whist ensuring that statutory consultees are kept informed about the nature of the proposal. As part of EIA, statutory and non-statutory consultees have an important role in providing site-specific data, contextual information and expertise. Consultation will enable evaluation and agreement of the scope and methods of any ecological investigations, including the period for data collection.

Baseline Survey Methods

Extended Phase 1 Habitat Survey

9.22. An Extended Phase 1 Habitat Survey will be undertaken between April and September 2019 in accordance with Joint Nature Conservancy Committee (JNCC) methods[25] for mapping and classifying natural and semi-natural habitats. The survey will record the higher plants of each habitat and will be carried out across the Site and up to a buffer of 250 m outwith the Site (where access permits).

9.23. The survey will also seek to determine the presence of non- native invasive species flora and fauna species as well as evidence of habitat suitability for protected species. Target Notes will be recorded to provide detail about features of particular interest.

National Vegetation Classification (NVC) Survey

9.24. An NVC survey will be carried out in according to standard methods[26] in spring/summer 2019. The survey will be carried out across all potentially sensitive habitats (such as Annex 1 habitats) across the Site and up to a 250 m buffer outwith the Site.

[25] JNCC, (2010), Handbook for Phase 1 habitat survey - a technique for environmental audit, ISBN 0 86139 636 7
26 Rodwell (2006) JNCC National Vegetation Classification: Users' handbook

9.25. NVC assesses the vascular plant, bryophyte and macro-lichen species within homogenous vegetation types to classify and map communities. (where access permits). This survey will also provide details of any potential Ground Water Dependent Terrestrial Ecosystems (GWDTE) present, which will be mapped in accordance with current SEPA/SNIFFER guidance[27].

Bat Surveys

9.26. Bat surveys will be carried out between April and October 2019 in accordance with new multi-stakeholder Bat Survey Guidelines[28]. A preliminary desk study of the Site and wider local area indicates that it is likely to be of low suitability for bats, largely due to the presence of dense conifer plantation woodland across the Site with limited suitability to support, commuting, foraging and roosting bats. Accordingly, we have proposed a low-risk survey strategy as detailed below.

9.27. Remote Monitoring Activity Surveys: Remotely operating full spectrum bat detectors will be used to automatically record bat activity on three seasonal occasions between April and October 2019 inclusive. In accordance with the 2019 survey guidelines and based on the proposed number of turbines (six), six AnaBat Swift bat detectors will be deployed for a minimum of ten consecutive nights each survey season. The AnaBats will be located within the potential turbine layout and a range of representative habitats, where feasible.

9.28. All bat data recorded during survey will be analysed using Anabat Incite analysis software, ideally within a month of it being recorded to ensure that issues are identified promptly.

9.29. Roost Surveys: Data searches will be conducted to identify known roost sites in the vicinity of the Site. Potential bat roosts on site will be identified and assessed during initial site visits and, if necessary, emergence/re-entry surveys carried out at potential roost sites considered to be at risk. The Site is dominated by conifer plantation and upland habitats so bat roosts are considered unlikely to occur within the 200 m of the Site.

9.30. Transect Surveys: Due to the dominance of habitats of low suitability to support bat and the spatial and temporal limitations of transect survey data generally, it is not believed that transect surveys would be of any notable additional value to the bat survey baseline data collected, and therefore would have a negligible influence in ensuring the robustness of the assessment on the potential impacts on bats. In light of this and in accordance with the 2019 guidelines, transect surveys have been scoped out of the proposed surveys.

27 SEPA (2011) Land Use Planning System SEPA Guidance Note 4 - Planning guidance on on-shore windfarm developments
28 Scottish Natural Heritage, Natural England, Natural Resources Wales, RenewableUK, Scottish Power Renewables, Ecotricity Ltd, the University of Exeter and the Bat Conservation Trust (BCT) (2019): Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation.

Protected Species Survey

9.31. Based on available habitats as well as historical and recent records, the Site has the potential to support several protected species including but not limited to: otter, water vole, pine marten, badger and red squirrel. The following species-specific surveys will be conducted to establish the status and distribution of these species.

9.32. Otter and water vole survey: Surveys will be carried out in summer 2019, avoiding surveying during or after periods of heavy rainfall. All watercourses within the Site and up to 200 m of the Development Area that are potentially at risk of impact will be surveyed in early summer by an experienced ecologist in accordance with SNH guidelines[29].

9.33. In line with established guidelines[29], should water vole surveys in early summer be inconclusive, a second survey may be required to be carried out in late summer/early autumn.

9.34. Red squirrel, badger and Pine Marten Surveys: A walkover survey will be carried out along suitable habitats up to 250 m of the Site in accordance with SNH guidelines29, to assess the suitability of habitats for badger, pine marten and red squirrel and to record signs of their presence.

Fisheries Habitat Survey

9.35. Atlantic salmon (*Salmo salar*) is known to be present in the eastern sections of the Burn of Acharole, which has the potential for connectively to the Site via Loch Burn, located to the south of the Site. In light of this a Fisheries Habitat Survey will be carried out by qualified surveyors in accordance with Scottish Fisheries Co-ordination Centre (SFCC) guidance[30] to identify the presence of salmonid spawning habitat that may be impacts by the Development. A detailed assessment of fish habitat quality and utilisation potential will be undertaken using baseline information collected following literature review, consultation and field survey.

9.36. The survey will also identify other sensitive areas, such as freshwater pearl mussel habitat or lamprey nursery habitat, and will inform the need for further more detailed surveys, such as electrofishing or freshwater pearl mussel surveys.

[29] SNH Protected Species Advice for Developers. [Online] Available at: https://www.nature.scot/professional-advice/planning-and-development/natural-heritage-advice-planners-and-developers/planning-and-development-protected-animals (Accessed 01/04/2019)
[30] SFCC (2007) Habitat Surveys - Training Course Manual – Revised [Online] Available at: https://sfcc.co.uk/assets/files/SFCC%20Habitat%20Training%20Manual.pdf (Accessed 26/03/2019)

Key Sensitivities

9.37. There are potential ecological sensitivities relating to wind farm developments in this part of Scotland. In the context of EcIA, these features will be defined as IEFs. Although IEFs cannot be confirmed until the completion of all baseline survey, it is anticipated that IEFs may include:

- Caithness and Sutherland Peatlands SAC/Ramsar - due to the proximity of the SAC and the potential presence of qualifying features within the Site; otter and blanket bog (or degraded bog with the potential to be restored), a Habitat Regulation Screening will be carried out;
- Sheilton Peatlands SSSI: due to the proximity of the SSSI and the potential presence of blanket bog, or degraded bog with the potential to be restored,
- Sensitive terrestrial habitats - these may include Annex I or Scottish Biodiversity List (SBL) habitats, potential GWDTEs. Although the site is dominated by conifer plantation, underlying habitats may include degraded bog habitats with restoration potential;
- Otter and Water vole – a number of watercourses and waterbodies located within and in close proximity to the Site have potential to support otter (a feature of the Caithness and Sutherland Peatland SAC/Ramsar) and water vole;
- Pine Marten and Red Squirrel – standing and recently felled coniferous plantation woodland as well as marginal and connecting habitats have the potential to support pine marten and red squirrel;
- Aquatic species/habitats – aquatic habitats in close proximity to the Site (such as the Burn of Acharole) have the potential to support sensitive aquatic species, such as salmonid fish; and,
- Bats – habitats within the Site may support a low number of common and widespread commuting and foraging bat species.

Potential Effects and Assessment

9.38. The ecological assessment will focus on the potential effects of indirect and direct impacts upon IEFs during construction, operation and decommissioning of the Development. This will be assessed in terms of, but not limited to, the effects of the following:

- Direct impacts on nearby designated sites and their qualifying interests;
- Direct and indirect habitat loss and disturbance - temporary or permanent loss to terrestrial and aquatic habitats;
- Turbine-related bat mortality - death or injury by collision with the turbine blades; and
- Indirect and direct effects on protected fauna including, but not limited to, otter, pine marten, water vole, red squirrel, and Salmonid fish.

Scoped In Effects

- Direct and indirect effects on the integrity of the Caithness and Sutherland SAC/Ramsar and the Sheilton Peatlands SSSI;
- Direct habitat loss and disturbance - temporary or permanent loss of Annex 1 or otherwise high value terrestrial habitats;
- In-direct habitat disturbance - temporary pollution or degradation of terrestrial or aquatic habitats;
- Turbine-related bat mortality - death or injury by collision with the turbine blades; and
- Indirect and direct effects on protected fauna including, but not limited to, otter, pine marten, water vole, red squirrel, and Salmonid fish - death or injury by collision with construction related plant, disturbance or displacement due to Development related pollution, noise and vibration and loss of habitats.

Scoped Out Effects

9.39. Based on the baseline conditions recorded to date or likely to be present, distance from the Site, and the nature of the relevant qualifying interests, it is proposed that impacts on of the following statutory sites (and related qualifying interests) lie outwith the Zone of Influence of the Development and are scoped out of further assessment:

- Loch Watten SAC;
- River Thurso SAC;
- Loch Watten SSSI; and
- Blar nam Faoileag SSSI.

Key Questions for Council / Consultees

9.40. Key questions for the Council and Statutory Consultees include:

- Are consultees content with the proposed methods for EcIA?
- Are consultees content with the extent of ecology datasets and completed surveys obtained to date?
- Are consultees content with the proposed scope of further surveys, including scoping out further wildcat surveys and bat transect surveys?
- Are consultees in agreement with the predicted IEFs that could be affected by the Development, as well as the effects scoped in /out of further assessment?

10. ORNITHOLOGY

Introduction

10.1. This chapter sets out the proposed approach to the evaluation of the ornithological interest of the Site and to the assessment of potential effects on birds.

10.2. The ornithological assessment will be carried out in line with relevant legislation and standards as well as having due regard to the following guidance:

- SNH Assessing the cumulative impact of onshore wind farm developments (2012);
- SNH Recommended bird survey methods to inform impact assessment of onshore wind farms (2014);
- SNH Assessing connectivity with Special Protection Areas (SPAs) (2016);
- SNH Assessing Significance of Impacts from Onshore Wind Farms Outwith Designated Areas (2018); and
- European Commission, Wind Energy Developments and Natura 2000 (2010).

10.3. For the purposes of this chapter it is important to clearly define the various terminology used. The follow key terms have been used throughout this chapter:

- "the Development" is the construction, operation and decommissioning of the Loch Toftingall Wind Farm;
- "the Site" is the area within which the Development lies; and
- "the Site Boundary" is the application site (i.e. red line) boundary.

Study Area

10.4. The Study Area was defined with reference to the Site Boundary of the Development and encompasses a series of buffers of up to 2 km radius; with buffer size dependent on the sensitivity of key species to potential effects associated with wind farm developments. The various survey areas, which make up the Study Area, are defined as follows:

- 'breeding bird survey area', 'winter walkover survey area' and 'core survey area' refers to the Site area plus an additional 500 m wide strip around the Site area (Figure 7, Appendix A);
- 'scarce breeding bird survey area' refers to the Site area plus an additional 2 km wide strip depending on the presence of contiguous suitable habitat outside of the core survey area (Figure 7, Appendix A); and

- 'flight activity survey area' refers to the area enclosed by a polygon around the outermost turbines of the Development plus an additional 500 m wide strip around the polygon (Figure 8, Appendix A).

10.5. The current land use of the Site is predominantly commercial conifer forest. Forest restructuring, involving felling and replanting, has been undertaken in recent years. Substantial areas of rough grassland and heather are present around the Site. These habitat types are relatively abundant and widespread in this part of Caithness.

Assessment Methodology

10.6. Particular consideration will be given in the assessment to potential effects on bird species whose populations are of moderate to high conservation concern and that belong to taxonomic groups that are considered to be particularly susceptible to impacts from wind farm development:

- Species listed on Annex1 of European Council Directive 2009/147/EC on the conservation of wild birds (i.e. 'Annex 1' species), in particular those that may be associated with populations of species that are qualifying interests of Special Protection Areas in the wider area;
- Species listed in Schedule 1 to the Wildlife and Countryside Act 1981, as amended (i.e. 'Schedule 1' species); and
- Species of national conservation concern, not included within the above categories, but that are present within the Study Area in nationally or regionally important numbers.

10.7. The following types of potential effects resulting from the Development on birds will be considered in depth:

- Construction: habitat modification, land-take, disturbance and displacement;
- Operation: disturbance and displacement, collision mortality;
- Decommissioning: similar effects as for construction but of lower intensity temporally and spatially; and
- Cumulative: combined effects across projects within the region, largely or entirely relating to overlap on operation effects.

10.8. Effects will be assessed against the existing baseline conditions, *i.e.* without the Development present. This assessment will be carried out assuming that there are no existing significant adverse effects on the population, range or distribution of a species (*i.e.* no significant effect on the species' conservation status) and no significant interference with the flight paths of migratory birds.

10.9. The assessment will first identify the possible effects of the Development and will then consider the likelihood of their occurrence. A judgement will then be made as to whether or not these effects are significant with respect to the EIA Regulations. In judging whether a possible effect is significant or not, two principal factors will be taken into account: the nature

conservation importance of the bird populations present and the magnitude of the likely effect.

10.10. In assessing the effects, emphasis will be given to the national and regional populations of the species. Trivial or inconsequential effects will be excluded.

10.11. The assessment will include proposals for measures to mitigate any identified adverse effects of the Development on bird species. Potential measures including micro-siting, the review of construction timing, and land management regimes will be considered, as appropriate, in consultation with the appropriate statutory consultees. The need for, and scope of, further monitoring of bird activity in relation to the Site will also be defined as part of the assessment process.

10.12. Impacts will be assessed in relation to species' population, range and distribution. Key considerations will include territory occupancy, breeding success, foraging success and ranging behaviour. The assessment will:

- Evaluate the nature conservation importance of the bird interest in a systematic manner; and
- Estimate the magnitude of likely effects on each species as a result of the proposal.

10.13. The significance of each potential effect will be judged by integrating scales relating to ecological value, behavioural sensitivity and effects magnitude in a reasoned way, in the context of the status of, and trends within, species' regional populations (as defined by SNH Natural Heritage Zones [NHZ]). If required, measures will be presented to mitigate any effects deemed to be significant in terms of the EIA Regulations.

10.14. The effects of the Development will be assessed in isolation and in combination with predicted effects of other wind farm developments in the same NHZ. As part of this process, data for other wind farm developments will be sought.

Baseline Conditions

Desk Study

10.15. Data from previous ornithological survey work carried out over a similar area during 2011 and 2012 were consulted for species present and their use of the area.

10.16. Information on the relevant national and internationally designated areas was gathered from the SNH website.

Consultation

10.17. SNH have been consulted during a pre-application meeting (6 March 2019) and requested that the assessment consider any direct or indirect impacts on the Caithness and Sutherland Peatlands SPA and Ramsar site, Caithness

Lochs SPA, and Shielton Peatlands SSSI. They considered an Appropriate Assessment is likely to be required. They also requested that surveys continue into April 2019 until wintering geese and swans have left to allow for a complete second winter to be included in the assessment.

Designated sites

10.18. Table 10.1 lists the sites designated for their ornithological features within 20 km of the site and these are also shown in Figure 9, Appendix A.

Table 10.1: Designated Sites within 20 km of the Development

Name	Designation	Designated For	Distance from Site Boundary
Caithness and Sutherland Peatlands	SPA	Red-throated diver Black-throated diver Common scoter Wigeon Golden eagle Hen harrier Merlin Short-eared owl Golden plover Dunlin Wood sandpiper Greenshank	0.67 km south
	Ramsar	Greylag goose Dunlin Breeding bird assemblage	
Caithness Lochs	SPA	Whooper swan Greenland white-fronted goose Greylag goose	3.2 km north-east
	Ramsar	Whooper swan Greenland white-fronted goose Greylag goose	
North Caithness Cliffs	SPA	Fulmar Guillemot Kittiwake	15.5 km north

Name	Designation	Designated For	Distance from Site Boundary
		Peregrine	
East Caithness Cliffs	SPA	Cormorant Fulmar Great black-backed gull Guillemot	16.5 km south-east
Shielton Peatlands	SSSI	Breeding bird assemblage	0.67 km south
Loch Watten	SSSI	Greylag goose	3.2 km north-east
Loch Scarmclate	SSSI	Greylag goose	5.2 km
Loch Calder	SSSI	Whooper swan Greenland white-fronted goose Greylag goose	10.7 km west
Lambsdale Leans	SSSI	Breeding Bird Assemblage	11.7 km west
Broubster Leans	SSSI	Breeding Bird Assemblage	14.9 km west
Loch Heilen	SSSI	Whooper swan Greenland white-fronted goose Greylag goose	15.3 km north-east
Loch of Wester	SSSI	Whooper swan	13.4 km

10.19. The Site is not located within or adjacent to any statutory sites designated for ornithological interest. The nearest statutory designated site for ornithological interest is the Caithness and Sutherland Peatlands Special Protection Area (SPA) which is situated c.0.7 km to the south and supports breeding populations of twelve species of birds.

10.20. Following current SNH guidance[31] in regards to the connectivity of SPA populations with supporting habitats in the wider environment, the distances to North Caithness Cliffs SPA and East Caithness Cliffs SPA are not within the reported range/connectivity distance for the qualifying species listed for the SPAs. As such, these SPAs do not warrant further consideration within the EIA.

10.21. There is potential for a likely significant effect on the Caithness and Sutherland Peatlands SPA and the Caithness Lochs SPA, since the Development is in a location where it may affect the qualifying interest of these SPAs. Therefore, the primary responsibility of the EIA is to provide

[31] SNH (2016) Assessing connectivity with Special Protection Areas (SPAs)

sufficient information to the competent authority to allow decisions to be made, under the processes required by the Habitats Regulations, as to whether the Development could affect the integrity of these SPAs. Similarly, the respective SSSI designation which spatially overlaps those of the SPAs will be assessed.

Bird Survey Methodologies

10.22. Scottish Natural Heritage guidance[32] was used for initial survey design and a range of baseline ornithological surveys commenced within the Site and surrounding area in April 2017.

10.23. The assessment will be informed by the following surveys:

- Breeding Bird Surveys (four visits, April to July 2017; within open ground in the Site and 500 m buffer);
- Scarce Breeding Bird Surveys (April to July 2017 and 2018; within Site and buffer extending up to 2 km);
- Flight Activity (vantage point) Surveys (April 2017 – April 2019 within Site and 500 m buffer of turbine locations);
- Migration Watches (September to November 2017 and March to May 2018 within Site and 500 m buffer); and
- Winter Walkovers (March 2018 and October 2018 to February 2019; within Site and 500 m buffer).

10.24. Survey methods follow contemporary best practice guidance; further details of the survey methods are provided below.

Breeding Bird Surveys

10.25. Breeding Bird Surveys (BBS) were carried out on the Site between April and July to gain a preliminary insight into the bird assemblage and possible sensitivities. The survey area for these included open ground within the Site and a 500 m buffer zone (Figure 7, Appendix A).

10.26. The Brown and Shepherd[33] method for surveying upland waders was modified to provide reliable estimates for some breeding moorland passerines by undertaking some surveys during the first few hours of daylight.

10.27. Surveys were conducted four times to allow for differences in detection rates between early and late breeding species.

Scarce Breeding Bird Surveys

10.28. Priority was given to detecting the species considered most likely to occur: red-throated diver (*Gavia stellata*), Common scoter (*Melanitta nigra*), greenshank (*Tringa nebularia*), osprey (*Pandion haliaetus*), hen harrier

[32] SNH (2014) Recommended bird survey methods to inform impact assessment of onshore wind farms
[33] Brown, A.F. and Shepherd, K.B. (1993) A method for censusing upland breeding waders. Bird Study 40: 3 pp189 -195.

(*Circus cyaneus*), merlin (*Falco columbarius*) and short-eared owl (*Asio flammeus*). Surveys focused on areas or sites suitable for nesting and foraging within a 2 km buffer of the Development. The survey methods to be used for each species are described below.

Diver Species

10.29. The methods described in Gilbert *et al.* (1998)[34] for surveying breeding diver species were used. All potential breeding sites within 2 km of the Development were checked for suitability and, if deemed to be required, further checks for occupancy were made at least twice per calendar month in May-July (Figure 7, Appendix A). Wherever possible, lochs were scanned from a distance to search for incubating birds or other evidence of breeding.

Common scoter

10.30. The methods described in Gilbert *et al.*[35] for surveying breeding common scoter was used, comprising a series of checks of all waterbodies within 2 km of the Development between late April and June (Figure 7, Appendix A).

Greenshank

10.31. The methods described in Gilbert *et al.*[36] for surveying breeding greenshank was used, comprising a series of checks of all suitable habitat within 2 km of the Development between April and June (Figure 7, Appendix A).

Osprey

10.32. Survey methods given in Hardey *et al*.[37] were followed. Targeted watches and searches focusing on sites known to have been used for nesting in previous years as well as any suitable nesting habitats were undertaken within the 2 km buffer (Figure 7, Appendix A).

Hen harrier

10.33. Survey methods given in Hardey *et al*.[38] were followed. Emphasis was given to searching habitats considered potentially suitable for nesting, in this case including areas of heath/bog with stands of heather > 0.4m tall, and suitable habitats within plantation forest within the 2 km buffer (Figure 7, Appendix A).

[34] Gilbert, G., Gibbons, D.W. and Evans, J. (1998) Bird monitoring methods. RSPB Sandy, Bedfordshire.
[35] Ibid
[36] Ibid
[37] Hardey, J., Crick, H., Wernham, C., Riley, H., Etheridge, B. and Thompson, D. (2013). Raptors, a field guide to survey and monitoring. The Stationery Office, Edinburgh.
[38] Ibid

Merlin

10.34. Survey methods given in Hardey *et al*.[39]were followed. Within suitable habitats, old crow nests (which could be re-used by merlin), fence-posts, hummocks, bushes and trees within 2 km of the Development (Figure 7, Appendix A) were checked for signs of occupation (e.g. plucked prey, moulted feathers, pellets and faeces). Emphasis was given to heath bog habitats with stands of heather >0.4m tall within the 2 km buffer (Figure 7, Appendix A).

Short-eared owl

10.35. Survey methods given in Hardey *et al*.[40] were followed. Suitable habitat was checked during April and May for evidence of hunting males, territorial activity and other signs of presence within the 2 km buffer (Figure 7, Appendix A).

Flight Activity Surveys

10.36. Information on bird flight activity was collected during timed watches from strategic Vantage Points (VPs) using the methods described by Band *et al*.[41]. The flight activity survey area is defined by the 500 m buffer of the Development (Figure 7, Appendix A).

10.37. A total of four VPs were selected through a mix of GIS analysis and field trials, with the aim of maximising ground visibility within the Site using the minimum number of points. Viewsheds are derived using a 20 m vertical cut-off and are truncated horizontally to 2 km (Figure 8, Appendix A).

10.38. In total 583 hours of VP observations were undertaken across all four VPs over two years. Watches from these vantage points did not exceed three hours in length and were timed to ensure each vantage point has observations spread throughout daylight hours each month.

10.39. The height above ground level of flights by target and secondary species was judged to be within one of several bands so that an estimate can be made of flight activity within the zone where turbine blades would be operating. The height bands used in the flight activity surveys are <10 m, 10-30 m, 30-50 m, 50-100 m, 100-150 m and >150m.

Migration Watches

10.40. Watches were undertaken from Migration Watch Points (MWP) with the aim of recording movements by geese, swans and waders at a landscape scale. These points gave good broad spatial coverage of the Site plus the wider countryside in respect of birds moving on a predominantly N-S axis. Observations totalling 36 hours were undertaken in the Autumn 2017 and totalling 36 hours in the Spring 2018.

[39] Ibid
[40] Ibid
[41] Band, W., Madders, M. & Whitfield, D.P. (2007) Developing field and analytical methods to assess avian collision risk at wind farms. In de Lucas, M, Janss, G.F.E. and Ferrer, M. (Eds.) Birds and Wind Farms: Risk assessment and Mitigation, pp. 259 - 275. Quercus, Madrid.

Winter Walk-over Surveys

10.41. Walk-over surveys were undertaken between September and March. These surveys are designed to complement surveys of breeding birds undertaken during the spring and summer, and occur within the 500 m survey buffer (Figure 7, Appendix A).

10.42. Walk routes meandered to closely examine as much ground as practical, in particular features of potential ornithological importance such as lochs /bog pools, bogs/mires, isolated trees/scrub and streams. Where practicable, observers used a different route on each visit to maximise the eventual spatial coverage of the survey area. Observers frequently paused to scan for birds.

Key Sensitivities

10.43. Given the habitat within the site boundary and within a 2 km buffer, potential sensitive receptors include red-throated diver, whooper swan, osprey and hen harrier. Surveys to assess the status of these species are described above.

Key Questions for Council / Consultees

10.44. The following are what are thought to be the key issues which require consideration by the consultees:

- Which, if any, SPAs do SNH consider the proposal could have a significant effect on and therefore for which sites the competent authority has to undertake an appropriate assessment?
- If appropriate assessment(s) is required, which plans or projects do SNH advise should be taken into consideration for the 'in combination' part of the assessment(s)?
- Are the consultees content with and / or have any comments on the list of effects and key sensitive receptors?
- Are the consultees content with and / or have any comments on the baseline survey methods and level of survey effort taking into consideration current guidance, the proposed scale and location of the wind farm, survey worked completed to date and identified sensitive receptors?
- Are the consultees content with and / or have any comments on the proposed receptor evaluation and impact assessment methods?

11. CULTURAL HERITAGE

Introduction

11.1. The 'cultural heritage' of an area comprises archaeological sites, historic buildings, gardens and designed landscapes, historic battlefields and other sites, features or places in the landscape that have the capacity to provide information about past human activity, or which have cultural relevance due to associations with folklore or historic events. Sites of cultural heritage interest may also be informed by their 'setting' within the wider landscape.

11.2. Historic landscape is not treated as a heritage asset for the purposes of this assessment except where a defined area of landscape has been designated for its heritage interest (including Conservation Areas, Historic Battlefields and areas included in the Inventory of Gardens and Designed Landscapes). It is recognised that all landscapes have an historic dimension, and this will be considered as part of the assessment of Landscape Character (covered in Chapter 8: Landscape and Visual Impact Assessment).

11.3. It is important to note that, although any effects on the heritage significance of assets due to change in their setting are likely to be visual in nature, the assessment of these visual effects is distinct from the assessment of visual change in the LVIA. The assessment of effects on setting may be informed by visualisations prepared as part of the LVIA but the conclusions reached regarding visual change in the setting of a heritage asset are distinct.

11.4. The Cultural Heritage section of this scoping report is intended to identify potential effects of the Development upon the physical fabric and settings of heritage assets within the Site, and potential effects on the settings of assets within the wider landscape.

11.5. The Cultural Heritage section of the EIA Report will characterise the historic environment within the Site and in the wider study area. It will use the results of consultation, desk-based research, walkover surveys, and setting visits to define a study area and to assemble a baseline of heritage assets within it, and then to assess the potential effects of the Development on that baseline. Where potential effects are identified, mitigation measures will be suggested.

Study Area

11.6. Two study areas have been used for the identification of heritage assets that may be affected by the Development:

11.7. The Inner Study Area (ISA) corresponds to the extent of the Site Boundary (Figure 10, Appendix A).

11.8. The Outer Study Area (OSA) extends to 20 km from the proposed turbines, which is taken as the maximum extent of potentially significant effects arising from changes to the settings of heritage assets (Figure 11, Appendix A).

Assessment Methodology

11.9. The assessment will be carried out with reference to the following national policy and guidance:

- Scottish Planning Policy (SPP) 2014;
- Standard and Guidance for Historic Environment Desk-Based Assessment (Chartered Institute for Archaeologists (CIfA 2014);
- Standard and guidance for commissioning work or providing consultancy advice on archaeology and the historic environment (CIfA 2014)
- Planning Advice Note (PAN) 2/2011: Planning and Archaeology;
- Historic Environment Policy for Scotland 2019 (HEPS); and
- Managing Change in the Historic Environment: Setting (Historic Environment Scotland 2016).

11.10. Regard will also be given to regional and/or local policy and guidance relevant to archaeology and cultural heritage. This will include relevant policies in the Highland-wide Local Development Plan (in particular Policy 57) and THC's own Standards for Archaeological Work (in particular Sections 3 and 4).

11.11. Effects on the historic environment can arise through direct physical impacts, impacts on setting or indirect impacts:

- Direct physical impacts describe those development activities that directly cause damage to the fabric of a heritage asset. Typically, these activities are related to construction works and will only occur within the Development footprint.
- An impact on the setting of a heritage asset occurs when the presence of a development changes the surroundings of a heritage asset in such a way that it affects (positively or negatively) the understanding, appreciation or experience of the cultural significance of that asset. Visual impacts are most commonly encountered but other environmental factors such as noise, light or air quality can be relevant in some cases. Impacts may be encountered at all stages in the life cycle of a development from construction to decommissioning but they are only likely to lead to significant effects during the prolonged operational life of the Development.
- Indirect impacts describe secondary processes, triggered by the Development, that lead to the degradation or preservation of heritage assets. For example, changes to hydrology may affect archaeological preservation; or changes to the setting of a building may affect the viability of its current use and thus lead to dereliction.

11.12. Cultural heritage constraint areas will, where necessary, be defined to include an appropriate buffer around known heritage assets. Constraint areas can be treated as a 'trigger' for the identification of potential direct impacts: they represent areas within which works *may* lead to direct impacts of more than negligible significance on known heritage assets.

11.13. Potential impacts on unknown heritage assets will be discussed in terms of the *risk* that a significant effect could occur. The level of risk depends on the level of archaeological potential combined with the nature and scale of disturbance associated with construction activities and may vary between high and negligible for different elements or activities associated with a development, or for the development as a whole.

11.14. Potential operational impacts on heritage assets will be identified from an initial desk-based appraisal of data from Historic Environment Scotland (HES) and the Highland Council (THC) Historic Environment Record (HER) and consideration of current maps and aerial images available on the internet. Where this initial appraisal identifies the potential for a significant effect, the asset will be visited to define baseline conditions and identify key viewpoints. Visualisations will be prepared to illustrate changes to key views, where potentially significant effects are identified.

11.15. Where potentially significant effects are identified, mitigation measures will be proposed. The preferred mitigation option is always to avoid or reduce impacts through design, or through precautionary measures such as fencing off heritage assets during construction works. Impacts which cannot be eliminated in these ways will lead to residual effects.

11.16. Adverse effects may be mitigated by an appropriate level of survey, excavation, recording, analysis and publication of the results, in accordance with a written scheme of investigation (SPP paragraph 150 and PAN2/2011, sections 25-27). Archaeological investigation can have a beneficial effect of increasing knowledge and understanding of an asset, thereby enhancing its archaeological and historical interest and offsetting adverse effects.

11.17. The consultees below will be approached for information to inform the EIA. These consultees may also be contacted by the THC regarding the scope of the EIA:

- THC Historic Environment Team;
- Historic Environment Scotland; and
- Local archaeological interest groups (as appropriate).

Baseline Conditions

11.18. The Baseline used for this scoping section has been compiled using existing data on the historic environment available online from HES via the Canmore database and the Pastmap website, and designations data available as GIS datasets from the HES website.

Inner Study Area

11.19. There are no designated heritage assets recorded within the ISA (Figure 10, Appendix A).

11.20. A study of the Pastmap website and the Canmore database has identified only one undesignated heritage asset recorded within the ISA. This comprises the remains of a small township first recorded on the 1877 1st Edition of the Ordnance Survey map and included in the HER (MHG18918, Figure 10, Appendix A).

11.21. The baseline of the assessment will be informed by reference to designations data maintained by HES and to THC HER. A digital extract will be obtained from the HER to ensure that the most up-to-date version of the data is used, and a walkover survey will be undertaken to confirm the presence of known features within the Site Boundary once the layout has progressed and likely infrastructure locations have been identified.

11.22. The type and distribution of known archaeological remains in the OSA (discussed below) indicates that there has been human activity in the vicinity of the ISA since at least the Neolithic period. However, the establishment of forestry plantations is likely to have removed or severely truncated any previously unidentified archaeological remains that may have existed within the ISA. The ISA is therefore considered to be of low or negligible archaeological potential.

Outer Study Area

11.23. There are two Scheduled Monuments and no Listed Buildings within 2 km of the Scoping layout.

11.24. There are an additional 18 Scheduled Monuments and four Listed Buildings (1 x Category A, 1 x Category B, and 2 x Category C) within 5 km of the turbines of the Scoping layout (Figure 11, Appendix A.

11.25. Between 5 km and 20 km from the turbines, there are 207 Scheduled Monuments (SM); 16 Category A Listed Buildings (LB), and three Conservation Areas (CA). Four of the Scheduled Monuments are also Properties in Care of Scottish Ministers (PiC).

11.26. There are no World Heritage Sites, Inventory Garden and Designed Landscape (IGDL) or Inventory Historic Battlefields (IHB) in the OSA.

11.27. The Scheduled Monuments comprise prehistoric ritual or funerary monuments; prehistoric forts and/or settlements; prehistoric, medieval and post-medieval industrial sites; medieval castles and forts; medieval crosses and/ or carved stones; medieval ecclesiastical sites; medieval and post-medieval structures including a bridge, shieling huts and settlements; and twentieth century military sites.

11.28. The Listed Buildings comprise a mixture of country houses, dovecotes and estate buildings, crofts, mills and farmsteads, warehouses and lighthouses, and churches and burial grounds.

11.29. The three CAs comprise Lybster (CA114), Thurso (CA125) and Wick - Pulteneytown (CA128). Wick CA contains one Category A Listed Building (LB42286 Wick Heritage Centre, 19-27 Bank Row, Wick). None of these are within 10 km of the Development.

11.30. The Pastmap website and the Canmore database record 98 undesignated heritage assets within 2 km. These comprise features representing a variety of periods from prehistoric standing stones to a second world war aircraft crash site.

Key Sensitivities

11.31. There is one undesignated heritage asset within the ISA. MHG18918 is a post-medieval township recorded on the HER. Located approximately 270 m south-west of the nearest turbine (T2), no significant operational effects are anticipated. Any potential construction impacts that may arise can be addressed through design solutions, or mitigation in the form of preservation by record.

11.32. There are 20 Scheduled Monuments within 5 km of the turbines, of which two are within 2 km of the turbines in the Scoping layout.

11.33. Knockglass Broch (SM561) is 1100 m to the north-west of the nearest turbine (currently T3) and Gallow Hillock cairn (SM450) is 1500 m north-east of T1. Both monuments may be subject to potential operational effects and will be fully assessed within the EIA Report as detailed in the Potential Effects and Assessment Section.

11.34. Other Scheduled Monuments within 5 km that may be subject to potential operational effects include a further eight brochs, four prehistoric cairns and a standing stone, and three medieval chapels. Selected Scheduled Monuments will be fully assessed within the EIA Report as detailed in the Potential Effects and Assessment Section.

11.35. There are four PiCs (also Scheduled Monuments) between 5 km and 20 km of the turbines in their present layout. The Cairn O'Get (PiC279), Castle of Old Wick (PiC282), the Grey Cairns of Camster (PiC297) and the Hill o'Many Stanes (PiC298) are to the south-east of the turbines. Selected PiCs will be assessed within the EIA Report as detailed in the Potential Effects and Assessment Section.

11.36. There is one Category A Listed Building within 5 km of the turbines in their present layout. Achingale Mill (LB14976) is 3.9 km ENE of T4. Selected Listed Buildings will be fully assessed within the EIA Report as detailed in the Potential Effects and Assessment Section.

Potential Effects and Assessment

Scoped In Effects

11.37. Within the ISA, all known and potential unknown assets will be assessed for potential direct, setting and indirect effects.

11.38. Within the OSA, assets will be included in the assessment based on the level of importance assigned to the asset (defined in the EIA Methodology), so as to ensure that all significant effects are recognised:

- Up to 2 km from proposed turbines: Category C Listed Buildings, and any undesignated asset of local importance which has a wider landscape setting that contributes substantially to the understanding, appreciation and experience of its cultural significance.
- Up to 5 km from proposed turbines: all assets of national or regional importance, including Scheduled Monuments, Category A and B Listed Buildings, Conservation Areas, Inventory Gardens and Designed Landscapes, Inventory Historic Battlefields and undesignated assets of more than local importance.
- Up to 20 km from proposed turbines: any asset which is considered exceptionally important, and where long-distance views from or towards the asset are thought to be particularly sensitive, in the opinion of the assessor or consultees.

Scoped Out Effects

11.39. The extent of ground disturbance associated with decommissioning will not extend beyond the construction footprint and so decommissioning effects on heritage assets within the ISA will not occur. Decommissioning effects are therefore to be scoped out of the assessment.

Key Questions for Council / Consultees

11.40. Are there any other relevant consultees who should be contacted with respect to the Cultural Heritage assessment?

11.41. Do consultees have any particular heritage assets that they would like to see included in the assessment?

11.42. Do consultees have any particular viewpoints or visualisations that they would like to see included in the assessment?

12. GEOLOGY AND PEAT

Introduction

12.1. An assessment of the impact of the Development on geology and peat will be undertaken. This will establish the baseline conditions as well as inform the assessments and design whilst determining any suitable mitigation measures required.

Assessment Methodology

12.2. The purpose of this assessment will be to:

- Define the peat extent, depth and properties across the Site;
- Assess the potential effects on peat disturbance;
- Assess the potential for peat destabilisation through identification of areas susceptible to peat slide, using peat thickness and digital terrain model (DTM) data to analyse slopes;
- Advise on the siting of turbines and tracks to areas of shallow or no peat; and
- Develop an acceptable code for construction that will adopt best practice procedures and effective management and control of onsite activities to reduce or offset any detrimental effects on the geology and soils including peat.

Peat Probing

12.3. Peat Probing generally comprises two phases, a preliminary phase (Phase 1) and a more detailed exercise once the proposed infrastructure has been defined (Phase 2). Phase 1 peat probing has been undertaken comprising 100 m centres, where possible, as shown on Figure 12, Appendix A. This will be supplemented by Phase 2 peat probe survey works which will focus on the design freeze site layout. Following consultation with SEPA, Phase 2 peat probing survey will be undertaken at 50 m centres along tracks and up to 50 m spacing either side to allow for micro-siting. Peat probing will also be undertaken at 10 m centres at each turbine location.

12.4. This approach is in accordance with Scottish Government's guidance on Peat Landslide Hazard and Risk Assessments[42]. The information gathered during peat probing will be utilised in preparation of Peat Landslide Hazard and Risk Assessment and outline Peat Management Plan.

Peat Slide Risk Assessment

12.5. Due to the presence of peat within the Site, a Peat Slide Risk Assessment will be undertaken in accordance with Scottish Government guidance and in consultation with the relevant consultees.

[42] Scottish Government (2017) Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments. Available at: http://www.gov.scot/Publications/2017/04/8868/0 [Accessed 08/02/2019]

12.6. The Peat Slide Risk Assessment will comprise detailed analysis and reporting on the final design and will include a hazard and slope stability assessment and preliminary peat management recommendations.

12.7. The hazards existing on the site will be ranked based on factors that influence stability, namely peat depth and slope gradient. In addition, receptors exposure to potential risk will be established and hazard rankings applied across the site, with management and mitigation measures recommended for an acceptable construction.

Outline Peat Management Plan

12.8. Arcus will prepare an outline peat management plan which will include high level estimation on peat excavation and re-use volumes. This will be based on the approximate infrastructure dimensions and anticipated re-use streams. This will:

- Define the materials that will be excavated as a result of the Development, focusing specifically on the excavation of peat;
- Determine volumes of excavated arisings, the cut/fill balance of the Development and proposals for re-use or reinstatement using excavated materials; and
- Detail management techniques for handling, storing and depositing peat for reinstatement.

Baseline Conditions

12.9. British Geological Survey (BGS) survey mapping indicates that the site is dominated by peat.

12.10. Bedrock geology mapping indicates that the site is underlain by Spital Flagstone Formation comprising Siltstone, Mudstone and Sandstone.

12.11. During a recent site walkover, quarrying activities were noted within the western extremities of the redline boundary, conjectured to be a sand quarry. Further details of the quarrying activities will be sought from the landowner and the local authority, as necessary.

Field Surveys

12.12. Preliminary phase peat probing comprising 100 m centre grid was undertaken as part of the initial EIA survey works in April 2019. During the survey works a total of 240 probes were completed. It should be noted that the probing focussed on areas where felling had taken place, forestry rides/fore breaks and area of forestry which were accessible. The surveyors found that there were parts of the site that were inaccessible for peat probing due to forestry wind damage and the density of planting. Phase 2 (detailed probing) will be agreed with SEPA prior to survey works and it is acknowledged that further measures may need to be taken to ensure access to proposed infrastructure is possible in densely forested and wind damaged areas.

12.13. Peat was recorded to be 1.0 m or less in the western area of the site and a central area to the immediate east of Loch Toftingall. Deep pockets of peat were recorded in the north, south-west and south-east ranging in depth up to 5.0 m in places. Figure 12, Appendix A illustrates the 'Interpolated Peat Depths'.

Key Sensitivities

12.14. At this stage, the main key sensitivities are considered to be:

- Soil type and associated land use (e.g. peat/blanket bog);
- Class 1 or 2 priority peatland, carbon-rich and peaty soils; and
- GWDTEs.

Potential Effects and Assessment

Peat Slide Risk

12.15. Development of wind farms on peatlands can lead to potential peat slide risk. An assessment of the likely impact on peatlands and the potential for peat slide risk will be undertaken and included as a Technical Appendix within the EIA Report.

Impact on Peatland Habitat

12.16. Excavation of peat during construction of site infrastructure, including access tracks, crane hardstandings, turbine foundations and cable trenches may lead to potential impacts on any peat habitat. In addition, natural surface drainage systems may change in this regard which could lead to drying and oxidation of in-situ peat.

Peatland Disturbance

12.17. Disturbance of organic rich peat soils leading to carbon loss. Carbon effects are discussed in more detail under the Climate Change Impact Assessment (CCIA), Section 21 of this Report.

Scoped In Effects

12.18. The potential effects that are to be considered during the assessment are:

- Potential peat slide risk to;
  - Inform the assessment of effects on peatlands;
  - Inform outline management measures for excavation and re-use of peat and peaty soils; and
- Details of embedded mitigation and restoration relative to Geology and Soils

Scoped Out Effects

12.19. The solid geology of the Site influences the site design and is not likely to receive a significant effect as a result of the Development as the geology is not protected or of designated regional importance; therefore, no significant change to the geology or mineral deposits is anticipated. It is therefore proposed to scope out the effects on solid geology from any further assessment.

12.20. The SEPA Waste Map has not identified any areas of contaminated land within the Core Study Area and no effects are anticipated. Should potentially contaminated land be encountered during excavations, this would be tested and appropriate action taken in accordance with The Environmental Protection Act 1990. Potential effects arising from contaminated land have, therefore, been scoped out of this assessment.

Key Questions for the Council / Consultees

12.21. The following questions have been designed to ensure that the proposed methodologies and assessment are carried out in a robust manner and to the satisfaction of the determining authorities:

- Do the consultees agree with the proposed methodology and scope of the Geology and Peat Assessment?
- Do the consultees have any information that would be useful in the preparation of the Geology and Peat assessment, including details of local quarrying activity?

13. HYDROLOGY AND HYDROGEOLOGY

Introduction

13.1. This section provides an appraisal of the potential hydrological and hydrogeological constraints associated with a development at the Site. This appraisal is based on publicly available resources as well as our knowledge of the Site and of wind farm developments in the local area.

Study Area

13.2. The following study areas will be considered as part of the assessment within the EIA Report:

- Core Study Area: comprising the Site boundary;
- Wider Study Area: within 10 km of the Site boundary. Due to potential for dilution and attenuation of potentially polluting chemicals and sediment it is considered that the potential for effects beyond this distance is limited; and
- Private Water Supply (PWS) Study Area: PWS will be identified within 2 km of the Site boundary. Beyond 2 km it is considered that potential for hydrological connectivity is limited.

Assessment Methodology

13.3. A site walkover, consultation, desk studies and data requests will be undertaken to inform the baseline and assessment.

13.4. The following activities will be undertaken to inform the hydrological and hydrogeological assessment:

- Review of published data and maps;
- Consultation with SEPA, The Highland Council (THC) and the British Geological Survey (BGS);
- Identification of solid and surface geologies;
- Review of Pollution Prevention Guidelines;
- Identification of surface water features, catchments and GWDTEs;
- Preparation of a catchment plan;
- Identification of data on public and private abstractions and supplies, and risk assessment of these;
- Identification of other similar developments within 10 km;
- Collation of flood plain information, water quality data and groundwater vulnerability information;
- Production of a Water and Construction Environmental Management Plan (WCMP); and
- Concise section within the EIA Report to assess Flood Risk to meet the requirements of the SPP Framework.

13.5. The EIA Report chapter will describe the potential effects of the Development including:

- Details of consultation undertaken;
- Assessment methodologies for construction and decommissioning phases;
- Hydrological walkover survey details and results;
- Assessment of the operational and decommissioning phases of the project to establish the effect on the hydrological resource;
- Identify mitigation measures, where necessary;
- Identify any residual effects following mitigation;
- Cumulative assessment with other developments within 10 km of the Development; and
- Statement of significance in accordance with the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 ("the EIA Regulations").

Baseline Conditions

13.6. An initial review of the hydrological conditions of the Development site has been undertaken. This section outlines the potential hydrological and hydrogeological receptors which have been identified within the Development site and the wider catchment in which it is located.

Surface Hydrology

13.7. The Site lies within the catchment of Allt Eireannaich, Loch Toftingall, Loch Burn, the Burn of Acharole, Hector's Burn and minor unnamed watercourses. Loch Burn flows south from Loch Toftingall which is located within the central section of the Site. Hector's Burn and Loch Burn join the Burn of Acharole to the south of the Site. The Burn of Acharole has a SEPA overall status of "Good". Loch Toftingall has a SEPA overall status of "Moderate".

Hydrogeology

13.8. The groundwater units underlying the Site are identified by Scotland's Environment mapping service as the Caithness groundwater body and has an overall SEPA classification of 'Good'.

13.9. BGS 1:625,000 digital mapping and the BGS GeoIndex shows the bedrock aquifer underlying the majority of the Site to consist of siltstone, mudstone and sandstone of the Spital Flagstone Formation. These rocks are classified by the BGS as "moderately productive aquifer" which locally yield small amounts of groundwater.

13.10. An assessment the potential effects on the groundwater resource will be undertaken in the EIA Report.

Groundwater Dependent Terrestrial Ecosystems

13.11. It is anticipated that peat deposits are located onsite and that GWDTEs will exist within the Site. The location, type and extent of the GWDTEs will be determined with the aid of a NVC survey, which will inform the assessment of the hydrological function of the GWDTEs, in accordance with Land Use Planning System Guidance Note 31, Version 2, (SEPA, 2014).

Designated Hydrological Receptors

13.12. Review of SNH GIS datasets available through the Scotland's Environment mapping service was used to identify statutory designated sites related to the water environment within 10 km of the Site boundary. Statutory designated sites are detailed in Table 13.1.

Table 13.1: Statutory Designated Sites within 10 km of the Site Boundary

Designation	Distance from Development
SAC	
Caithness and Sutherland Peatlands	650m south
Loch Watten	3.3 km north-east
River Thurso	3.8 km west
SSSI	
Shielton Peatlands	650m south
Loch Watten	3.3 km north-east
Loch Scarmclate	5.2 km north
Blar nam Faoileag	4.5 km south-west
Dirlot Gorge	6 km south-west
Strathmore Peatlands	7 km south-west
Loch of Winless	9.6 km east
Moss of Killimster	10.0 km east

SPA	
Caithness and Sutherland Peatlands	650m south
Caithness Lochs	3.3 km north-east

13.13. As the Development lies outside the catchment of the following designations, it is proposed that effects on these sites are scoped out of the EIA:

- All SACs, SSSIs and SPAs with the exception of Caithness and Sutherland Peatlands SAC and Shielton Peatlands SSSI.

Private and Public Water Supplies

13.14. A 2 km search radius from the Site boundary will be used to request information on the location, type and source of private water supplies from THC. Residents with PWS as identified by THC will be contacted to ascertain the location of PWS infrastructure in order for this to be considered during the Development design and assessed in the EIA Report.

Flooding

13.15. The Indicative River and Coastal Flood Map (Scotland) produced by SEPA shows the areas of Scotland with a 0.5 % (1:200) or greater chance of flooding. These areas are known as medium to high risk areas for flooding.

13.16. The SEPA Flood Map shows that minor areas either side of the Burn of Acharole to the south of the Site and Loch Toftingall in the central section of the Site is classed as having a "High" annual probability of flooding in any year.

13.17. The flood maps show flooding is restricted to the waterbodies and do not indicate wide scale flooding across the Site.

13.18. An initial 50 m buffer will be placed around watercourses onsite; therefore, it is not anticipated that turbines or electrically sensitive equipment will be located within these areas of potential flood risk. As such, a concise section within the EIA Report will consider whether the Development is at risk of flooding and if the Development will impact surface water run-off and effects on off-site receptors, in accordance with paragraphs 255 to 268 of the Scottish Planning Policy (SPP).

Key Sensitivities

13.19. At this stage, the key sensitive receptors are considered to be Allt Eireannaich, Loch Burn, Loch Toftingall and their tributaries, groundwater, designated hydrological receptors, the hydrological function of potential GWDTEs and Private Water Supplies.

Potential Effects and Assessment

Scoped In Effects

13.20. The following aspects will be assessed when considering the effects of the Development on hydrology and hydrogeology:

- Chemical pollution;
- Sedimentation as a result of construction;
- Impediments to watercourse and near-surface water flow;
- Acidification of Watercourses as a result of felling;
- Effects on PWS and public water supplies;
- Effects on GWDTEs;
- Increased run-off and flood risk; and
- Compaction of superficial deposits.

Scoped Out Effects

13.21. It is proposed that the migration of pollutants from contaminated land is scoped out of the assessment as the Site has not previously been developed, and it is not likely contaminated land will be encountered.

13.22. It is proposed that effects of the Development on all statutory designations (with the exception of Caithness and Sutherland Peatlands SAC and Shielton Peatlands SSSI) are scoped out of the assessment as there is no hydrological connectivity between the Development and these receptors.

13.23. There is limited potential for pollution and sedimentation effects on the water environment at distances greater than 10 km and it is proposed that receptors beyond this distance are scoped out.

Embedded Design Measures

13.24. A 50 m buffer zone will be established for all turbine bases and ancillary structures / infrastructure around the watercourses on the site, where possible.

13.25. The requirement for access tracks crossing watercourses will be minimised, where possible, during the design stage.

13.26. A Water and Construction Management Plan (WCMP) will accompany the EIA Report and form part of the embedded development design. The WCMP will comprise methods and works that are established and effective measures to which the Applicant will be committed through the development consent. Accordingly, the assessment of significance of effects of the Development will be considered with the inclusion of the WCMP.

13.27. Measures in order to protect the water environment will be outlined in the WCMP and will be based on good construction practice outlined in the following documents:

- Pollution Prevention Guidelines (PPGs and GPPs) 1 to 21;
- Scottish Natural Heritage (SNH) (2015), Good Practice During Wind Farm Construction;
- The Construction Industry Research and Information Association (CIRIA) (2015), Environmental Good Practice on Site (C741); and
- CIRIA (2001), Control of Water Pollution from Construction Sites (C532).

Key Questions for Council / Consultees

13.28. The following questions have been designed to ensure that the proposed methodologies and assessment are carried out in a robust manner and to the satisfaction of the determining authorities:

- Do the Council and the consultees agree with the proposed methodology and scope of the hydrology and hydrogeology assessment?
- Does the Council, SNH, SEPA or other consultees have any information that would be useful in the preparation of the hydrology and hydrogeology assessment?

14. NOISE

Introduction

14.1. Sources of noise during operation of a wind turbine are both mechanical (from machinery housed within the turbine nacelle) and aerodynamic (from the movement of the blades through the air). Modern turbines are designed to minimise mechanical noise emissions from the nacelle through isolation of mechanical components and acoustic insulation of the nacelle. Aerodynamic noise is controlled through the design of the blade tips and edges. In most modern wind turbines, aerodynamic noise is also restricted by control systems which actively regulate the pitch of the blades.

14.2. Noise from the wind turbines increases with wind speed, at the same time ambient background noise (for example wind in trees) usually increases at a greater rate. Planning conditions are used to enforce compliance with specified limits.

14.3. The effects of noise from the Development will be assessed in consultation with the Environmental Health Department of Highland Council.

Study Areas

14.4. The following study areas will be considered:

- Construction and decommissioning noise: within approximately 500 m of the proposed locations of wind turbines and development infrastructure;
- Operational noise: within approximately 2 km of the proposed locations of wind turbines; and
- Cumulative operational noise will be considered for other wind energy developments within approximately 5 km of the proposed turbine locations.

14.5. The precise definition of the study areas will be confirmed through preliminary noise modelling.

Assessment Methodology

Guidance

14.6. The following guidance and information sources are pertinent to the assessment of wind turbine noise:

- The Scottish Government's planning information on onshore wind turbines[43];

[43] Scottish Government (2014). 'Onshore Wind Turbines'. Available Online At: https://beta.gov.scot/publications/onshore-wind-turbines-planning-advice/ [Accessed 22/03/2019]

- Planning Advice Note 1/2011 (PAN1/2011): Planning and Noise[44];
- ETSU-R-97: The Assessment and Rating of Noise from Wind Farms[45]; and
- A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise[46].

Scottish Government Planning Information on Onshore Wind

14.7. The Scottish Government's Online Renewables Planning Advice states that ETSU-R-97 should be used to assess and rate noise from wind energy developments, together with the Institute of Acoustics' A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise.

PAN 1/2011: Planning and Noise

14.8. PAN 1/2011 provides advice on the role of the planning system in helping to prevent and limit the adverse effects of noise. It promotes the principles of good acoustic design and the appropriate location of new potentially noisy development. An associated Technical Advice Note offers advice on the assessment of noise impact and includes details of the legislation, technical standards and codes of practice appropriate to specific noise issues.

14.9. Appendix 1 of the Technical Advice Note: Assessment of Noise describes the use of ETSU R 97 in the assessment of wind turbine noise.

ETSU-R-97

14.10. The assessment methodology for operational noise is described in ETSU-R-97 'The Assessment and Rating of Noise from Wind Farms'. The aim of ETSU-R-97 is to provide:

"Indicative noise levels thought to offer a reasonable degree of protection to wind farm neighbours, without placing unreasonable restrictions on wind farm development or adding unduly to the costs and administrative burdens on wind farm developers or local authorities".

14.11. The report makes it clear from the outset that any noise restrictions placed on a development must balance the environmental impacts of the proposed development against the national and global benefits which would arise through the development of renewable energy sources.

14.12. Noise criteria (or limits) are specified, which are a combination of a margin of 5 dB above the prevailing, wind speed-dependent, background noise level and fixed lower noise limits, which are applicable in low background noise situations. The fixed lower noise limits are defined as:

[44] The Scottish Government (2011) PAN 1/2011: Planning and Noise
[45] ETSU (1996) ETSU-R-97 The Assessment and Rating of Noise from Wind Farms
[46] Institute of Acoustics (2013) A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise

- 35 - 40 dB, $L_{A90,10min}$ during the day, with the value chosen dependent on the number of affected properties, the effect of the number of kWh (kilowatt-hours) generated and the duration and level of exposure;
- 43 dB, $L_{A90,10min}$ at night, a level chosen to safeguard against sleep disturbance; and
- 45 dB, $L_{A90,10min}$ at properties where the occupier has a financial involvement in the proposed development, during both the day and night.

14.13. Highland Council typically require a reduced night-time fixed lower noise limit of 38 dB, $L_{A90,10min}$

14.14. The specified noise limits relate to the cumulative effects of all turbines that affect a particular location.

14.15. Where the occupier of the property has a financial interest in a development, ETSU-R-97 states that the fixed lower noise limit for both daytime and night-time can be increased to 45 dB(A) and that *"consideration should be given to increasing the permissible margin above background".*

The Good Practice Guide

14.16. The Good Practice Guide (GPG) was published by the Institute of Acoustics (IOA) in May 2013 and has been endorsed by the Scottish Government as current industry best practice (IOA, 2013). The guide presents current good practice in the application of ETSU-R-97 assessment methodology for wind turbine developments at the various stages of the assessment and will be followed throughout the assessment.

Methodology

14.17. The specific methodologies involved in applying ETSU-R-97 to a proposed new development will be detailed in full in the EIA Report but, in summary, these provide recommendations for noise limits relating to the existing levels of background noise for quiet day-time and night-time periods.

14.18. To carry out a noise assessment in accordance with ETSU-R-97, the following steps are required:

- Specify the number and locations of the wind turbines;
- Identify the locations of the nearest, or most noise sensitive, neighbours;
- Determine the background noise levels as a function of site wind speed at the nearest neighbours, or a representative sample of the nearest neighbours;
- Determine the quiet day time and night time criterion curves from the background noise levels identified at the nearest neighbours;
- Specify the type and noise emission characteristics of the wind turbines proposed for the site;

- Calculate the noise immission[47] l levels due to the operation of the wind turbines as a function of site wind speed at the nearest neighbours; and
- Compare the calculated noise immission levels with the derived criterion curves and assess in the light of relevant planning requirements.

Baseline Conditions

14.19. For consistency with the other wind farms in the area, it is proposed to adopt baseline noise levels established for Causeymire in the assessment. This will also ensure that the baseline noise levels applied will not be affected by any operational wind turbines, in accordance with ETSU-R-97.

14.20. The locations of potential noise-sensitive receptors are shown in Figure 13, Appendix A.

Key Sensitivities

14.21. The area around the Development already features a number of consented and operational wind farms. Highland Council highlighted in pre-application discussions that cumulative noise was therefore likely to be a key sensitivity.

14.22. The following wind farm developments have been identified as those most likely to result in significant cumulative noise effects with the Development:

- Causeymire (operational);
- Bad a Cheo (built but not yet operational);
- Achlachan I (built but not yet operational); Achlachan II (consented)
- Halsary (consented).

14.23. The locations of these developments can be seen in Figure 3, Appendix A.

14.24. A preliminary cumulative noise analysis has been carried out based on publicly-available information about the other wind farm developments in the area. The findings of the analysis have informed the Scoping Layout presented within Report in Figure 2, Appendix A. Further iterative evolution of this layout will occur during the EIA and design process.

[47] Immission' refers to the noise at a receiver location, whereas 'emission' relates to noise produced by a source.

Potential Effects and Assessment

Scoped In Effects

Cumulative Operational Noise

14.25. ETSU-R-97 and the GPG state that the noise limits apply to the cumulative effect of noise from all wind turbines that may affect a particular location. Therefore, a search will be undertaken to identify any further wind energy developments either operational, consented or in planning which may require consideration in the assessment process, based on consideration of the '10 decibel difference' rule described in the GPG. A screening exercise will then be carried out to identify noise-sensitive receptors which require inclusion in the cumulative assessment.

Scoped Out Effects

Low Frequency Noise and Infrasound

14.26. A study[48], published in 2006 by acoustic consultants Hayes McKenzie on the behalf of the DTI, investigated low frequency noise from wind farms. This study concluded that there is no evidence of health effects arising from infrasound or low frequency noise generated by wind turbines, but that complaints attributed to low frequency noise were in fact, most likely due to a phenomenon known as Amplitude Modulation (AM).

14.27. In February 2013, the Environmental Protection Authority of South Australia published the results of a study into infrasound levels near wind farms[49]. This study measured infrasound levels at urban locations, rural locations with wind turbines close by, and rural locations with no wind turbines in the vicinity. It found that infrasound levels near wind farms are comparable to levels away from wind farms in both urban and rural locations. Infrasound levels were also measured during organised shut downs of the wind farms; the results showed that there was no noticeable difference in infrasound levels whether the turbines were active or inactive.

14.28. Bowdler et al. (2009) [50] concludes that:

14.29. "...there is no robust evidence that low frequency noise (including 'infrasound') or ground-borne vibration from wind farms generally has adverse effects on wind farm neighbours".

Amplitude Modulation

14.30. In its simplest form, Amplitude Modulation (AM), by definition, is the variation in noise level of a given source. This variation (the modulation)

[48] The measurement of low frequency noise at three UK wind farms, Hayes McKenzie, The Department for Trade and Industry, URN 06/1412, 2006
[49] Environment Protection authority (2013) Infrasound levels near wind farms and in other environments [online] Available at: http://www.epa.sa.gov.au/xstd_files/Noise/Report/infrasound.pdf
[50] Bowdler et al. (2009). Prediction and Assessment of Wind Turbine Noise: Agreement about relevant factors for noise assessment from wind energy projects. Acoustic Bulletin, Vol 34 No2 March/April 2009, Institute of Acoustics

occurs at a specific frequency in the case of wind turbines, which is defined by the rotational speed of the blades.

14.31. There is a distinction between 'normal' AM of wind turbine noise, characterised as blade swish and Enhanced AM (EAM) or Other AM (OAM), sometimes characterised onomatopoeically as 'thump'. It should be noted that ETSU-R-97 describes and makes allowance for normal AM or blade swish.

14.32. A study[51] was carried out in 2007 on behalf of the Department for Business, Enterprise and Regulatory Reform (BERR) by the University of Salford, which investigated the incidence of noise complaints associated with wind farms and whether these were associated with AM. This report defined AM as aerodynamic noise from wind turbines with a greater degree of fluctuation than normal at blade passing frequency. Its aims were to ascertain the prevalence of increased AM (OAM) on UK wind farm sites, to try to gain a better understanding of the likely causes, and to establish whether further research into AM is required.

14.33. The study concluded that OAM had occurred at only a small number (4 of 133) of wind farms in the UK, and only for between 7% and 15% of the time. It also stated that, the causes of OAM were not well understood and that prediction of the effect was not then currently possible.

14.34. This research has recently been supported by an in-depth study undertaken by Renewable UK[52], which has identified that many of the previously suggested causes of OAM have little or no association to the occurrence of OAM in practice. The generation of OAM is based upon the interaction of a number of factors, the combination and contributions of which are unique to each site. With the current state of knowledge, the research concludes that is not possible to predict whether any particular site is more or less likely to give rise to OAM, and the incidence of OAM occurring at any particular site remains low, as identified in the University of Salford study. The report includes a sample planning condition to address AM; however, that has not yet been validated or endorsed by UK Government or the IOA.

14.35. In 2016, the IOA proposed a measurement technique[53] to quantify the level of AM present in any particular sample of windfarm noise. This technique is supported by the Department of Business, Energy & Industrial Strategy (BEIS, formerly The Department of Energy & Climate Change) who have published guidance[54], which follows on from the conclusions of the IOA study in order to define an appropriate assessment method for AM, including a penalty scheme and an outline planning condition. Notwithstanding this, the suggested outline planning condition is as yet

[51] Research into aerodynamic modulation of wind turbine noise'. Report by University of Salford, The Department for Business, Enterprise and Regulatory Reform, URN 07/1235, July 2007.
[52] Wind Turbine Amplitude Modulation: Research to improve understanding as to its Cause and effects, Renewable UK, 2013
[53] Institute of Acoustics, (2016) A Method for Rating Amplitude Modulation in Wind Turbine Noise
[54] BEIS, (2016), Review of the evidence on the response to amplitude modulation from wind turbines

unvalidated, remains in a draft form and would require site-specific legal advice on its appropriateness to a specific development.

14.36. Section 7.2.1 of the GPG therefore remains current, stating: "the evidence in relation to 'Excess' or 'Other' Amplitude Modulation (AM) is still developing. At the time of writing, current practice is not to assign a planning condition to deal with AM".

Ground Borne Vibration

14.37. Research undertaken by Snow[55] in 1996 found that levels of ground-borne vibration 100 m from the nearest wind turbine were significantly below criteria for 'critical working areas' given by British Standard BS6472:1992 Evaluation of human exposure to vibration in buildings (1 Hz to 80 Hz), and were lower than limits specified for residential premises by an even greater margin.

14.38. Ground-borne vibration from wind turbines can be detected using sophisticated instruments several kilometres from a wind farm site as reported by Keele University[56]. This report clearly shows that, although detectable using highly sensitive instruments, the magnitude of the vibration is orders of magnitude below the human level of perception and does not pose any risk to human health.

Construction and Decommissioning Noise

14.39. Noise during the Development's construction phase will consist of that generated by on site activities and noise due to construction traffic on public roads. Whilst the precise location of construction works has yet to be established, the closest noise-sensitive receptor is likely to be located to the west of the Development, situated approximately 1 km from the closest turbine location, based upon the current scoping layout.

14.40. By virtue of the large separation distances and low number of residential receptors in the locality, construction noise impacts are anticipated to be minimal, and will therefore be scoped out of the assessment. Notwithstanding this, the assessment will include a discussion of construction noise guidance and detail best practice methods for minimising construction noise impact in line with the requirements of BS5228:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open sites.

14.41. The effects of noise during decommissioning of the Development are likely to be similar to those during construction. However, both the magnitude and duration of such effects are likely to be less than those during construction.

[55] ETSU (1997), Low Frequency Noise and Vibrations Measurement at a Modern Wind Farm, prepared by D J Snow
[56] Microseismic and infrasound monitoring of low frequency noise and vibrations from wind farms: recommendations on the siting of wind farms in the vicinity of Eskdalemuir, Scotland". Keele University, 2005

Key Questions for Council / Consultees

- Are consultees content with the proposed methodology and scope of assessment?
- Do the Council and consultees have details of any other wind energy developments in the locality which it considers may raise significant cumulative noise issues?
- Are consultees content to scope out Low Frequency Noise and Infrasound, Amplitude Modulation, Ground Borne Vibrations and Construction and Decommissioning noise?

15. TRAFFIC AND TRANSPORT

Introduction

15.1. This Section of the Report details the methodology proposed to evaluate the effect of the Development on traffic and transportation resources within the study area. Vehicle movements to the Development will consist of abnormal load vehicles (ALVs), heavy goods vehicles (HGVs), light good vehicles (LGVs) and cars.

15.2. The EIA will identify the potential effects from increased road traffic arising from construction, operation and decommissioning of the Development. The significance of these effects will be assessed against recognised guidelines. Where required, appropriate mitigation measures will be proposed to reduce these effects. The access and traffic aspects will consider the effects of the Development on the road network and traffic volumes.

15.3. Presently, the origin and route to site for the wind turbines and construction materials have not been finalised although the abnormal indivisible loads are likely to be transported from Wick Harbour, along the A99 to Latheron and then north along the A9. This section outlines the proposed methodology to be employed in the EIA for assessment of Traffic and Transportation effects on the chosen delivery routes and on the wider road network as required.

Study Area

15.4. The Study Area is defined by the public road network in the vicinity of the Development and potential delivery corridors to be used during construction. These take into account the local strategic / Trunk Road network, sources of labour and the potential sources of construction materials, specifically stone and concrete from local quarries.

15.5. The Study Area will be further defined in the EIA Report when the route to the Site has been confirmed.

Assessment Methodology

Overview

15.6. The geographic scope of these studies will be confirmed in consultation with the relevant road authorities. However, based on the location identified for the Development, it is anticipated the study will need to encompass the B870, the A882 and the A99 and A9 corridors which connect Wick Harbour, the likely port of delivery. All potential receptors along these routes will be considered.

15.7. With the exception of the turbine components, the majority of construction traffic is normal construction plant and could include tractors, excavators,

rollers, cranes and dumper trucks; most of which will arrive on site on low loader transporters. Additionally tree felling operations can generate traffic and depending on timetabling can represent a significant proportion of the overall construction traffic. The turbine elements will arrive on specialist transport vehicles.

15.8. Baseline traffic flow conditions on routes within the study area will be established and detailed within the EIA. This geographic scope of the baseline assessment will be confirmed in consultation with the Council. As construction vehicles may approach the Development from a distributed set of origins then all routes within the study area will be assessed.

15.9. Where publicly available traffic flow information is available, for example from the Department of Transport (DfT), then this will be used as a basis for baseline assessment. Additional traffic survey data will be procured as necessary to inform the transport assessment.

15.10. The assessment methodology will follow the 'Guidelines for the Environmental Impact of Road Traffic'[57]. A screening process using two broad rules outlined in the aforementioned guidelines will be adopted to identify the appropriate extent of the assessment area. These are:

- Include highway links where traffic will increase by more than 30% (or where the number of Heavy Goods Vehicles will increase more than 30%); and
- Include any other specifically sensitive areas where traffic flows have increased by 10% or more.

15.11. Where the predicted increase in traffic flows is lower than the thresholds, the guidelines suggest the significance of effects can be stated to be low or not significant and further detailed assessments are not warranted. Peak traffic flows will be identified to assess a worst-case scenario. Assessment of driver distraction will be undertaken as appropriate.

15.12. Traffic movements on the public roads resulting from construction will be based on the assessed Development design. Traffic generation will take into account the import of construction materials and the export of surplus materials as well as the movement of equipment, construction plant and labour required during each phase.

15.13. Peak traffic flows will be identified to assess a worst-case scenario. An assessment of effects on road safety, driver delay, pedestrian amenity, severance, noise and vibration will be undertaken as appropriate.

15.14. In addition to the aforementioned guidance this chapter will take into account the following statutory guidance documents published by the Scottish Government:

- SPP;

[57] Institute of Environmental Assessment (1993) Guidelines for the Environmental Assessment of Road Traffic, IEA.

- PAN 75 – Planning for Transport[58]; and
- Scottish Government Planning Specific Advice Sheet for Onshore Wind Turbines (last updated December 2013).

15.15. It should be noted that the above list may be subject to change in the case that various policies and guidance are replaced or updated during the assessment. In addition, other relevant guidance required by the Applicant will be considered for inclusion.

15.16. Access options from the public road will be investigated as part of the EIA process, including the use and upgrade of existing tracks. The red line boundary would be amended as required to ensure the final selected route to the public road is included in its entirety.

15.17. During the operational phase, volumes of traffic are very limited with occasional peaks resulting from specific major maintenance activities. It is therefore proposed that operational traffic is scoped out of further assessment.

15.18. On decommissioning, much of the constructed infrastructure will remain in situ. In the case of access tracks, these will likely become a key part in land management and left in an operational condition, and below ground elements such as foundations would be left in place. As such, the construction case is deemed worst case and traffic relating to decommissioning can be scoped out of further assessment.

Assessment of Effects

15.19. In assessing traffic effects, we would make use of the findings of the access route study for the physical constraints and measures required for access. It is possible that baseline traffic surveys will be required to supplement existing records. The study would consider effects on:

- Road Users (delay and safety);
- Road Infrastructure (dilapidation); and
- Adjacent community/properties (safety and congestion).

15.20. Numerical analyses of delay, etc using network modelling or junction modelling is presently assumed not to be required. The study would only consider effects during construction.

15.21. The approach to assessing sensitivity and magnitude of effects is a judgement-based approach as used in recent EIAs and the detailed methodology. In terms of road networks, the sensitivity to change in traffic levels of any given road segment or junction is generally assessed by considering the residual capacity of the network under existing conditions. Where there is a high degree of residual capacity, the network may readily accept and absorb an increase in traffic, and therefore the sensitivity may be said to be low. Conversely, where the existing traffic

[58] Scottish Executive (2005) Planning Advice Note: PAN 75 – Planning for Transport , Scottish Executive

levels are high compared to the road capacity, there is little spare capacity, and the sensitivity to any change in traffic levels would be considered to be high.

15.22. The determination of the magnitude of the effects will be undertaken by reviewing the outline proposals for the Development, establishing the parameters of the road traffic that may cause an effect, and quantifying these effects.

15.23. In brief, the steps involved in this study would be as follows:

- Consultation with the relevant road authorities and emergency services (the Council, Transport Scotland, Police etc.) as well as any local forestry interests;
- Procure existing traffic data, and arrange additional surveys where necessary
- Carry out route inspections including detailed observations of each community potentially affected by the proposals within the study area. The detailed and numeric assessment would be limited to the roads in closer proximity to the site, i.e. between the B870, A9 and the site entrance;
- Based on the route inspections, sensitive receptors would be identified;
- An initial assessment of traffic generation from the proposed construction works would be undertaken. Assignment of traffic to the network, and an initial assessment of effects. This will be based on professional judgement rather than transportation network modelling;
- Obtain refined project needs, refine traffic generation, and re-assess effects, using obtained baseline traffic data;
- Assess abnormal load movements, including swept path analysis and potential mitigation measures, in order to demonstrate that the selected route is feasible for the size of turbines proposed;
- Assess residual effects following the primary mitigation built in by virtue of the above-mentioned iteration, and any required residual mitigation needs; and
- Identify and assess the potential for cumulative effects based on other known developments.

15.24. Formal Traffic Assessments principally relate to developments that generate a significant permanent increase in traffic as a direct consequence of function (for example, retail parks) whereas a wind farm is temporary and the function does not result in a permanent traffic increase, as such it is proposed that a formal traffic assessment is scoped out.

Baseline Conditions

15.25. The Site is located to the south of the B870 road, which connects residential properties and settlements to the north of the Site to the A9 road and the small settlements of Mybster and Spittal to the northwest.

The A9 continues north from Mybster in the direction of Thurso. The A9 south goes on to connect with the A99 at Latheron.

15.26. Subject to detailed assessment, the potential route to the Site has been identified from Wick Harbour, south along the A99 towards Latheron, before turning northwards on the A9 towards the proposed Site. The final site entrance location is yet to be defined but will either be formed on the A9 or the B870 subject to detailed assessment. The route has been successfully used by large HGV (including abnormal loads such as wind turbine components) for the construction of other wind farms in the vicinity of the proposed development site.

15.27. An abnormal loads route assessment will be completed and submitted as a technical appendix.

Key Sensitivities

15.28. The main sensitives relating to the Development are considered to be:

- Increase in HGV traffic;
- Delay related to the movement of abnormal loads;
- Abnormal road wear and tear; and
- Road widening/improvements to accommodate abnormal loads.

Potential Effects and Assessment

Permanent

15.29. There is not predicted to be any permanent impact on the road network in the area taking account of the scale of the proposals and the number of anticipated heavy loads. Depending on further site surveys, the access into the site will either be direct from the A9 or from the B870, and would require a new access junction and potentially minor improvement works.

Construction

15.30. The volume of construction site traffic is unlikely to cause any significant disruption to traffic, cyclists or other road users in the area as all roads are relatively lightly trafficked and capable of accommodating the short term increases in traffic associated with wind farm construction. The small number of abnormal loads required to deliver turbine components would be escorted during off peak periods to cause minimal temporary disruption to other road users.

15.31. The indirect effects of temporary increases in traffic on sensitive roadside receptors such as residential properties would be considered as part of the detailed noise and air quality studies for the EIA. The anticipated increase in daily traffic movements from construction vehicles would be compared with baseline flows and an assessment of the potential for amenity effects undertaken based on the predicted percentage changes in flows. On the basis of current information on construction traffic generation, it is not

expected that levels of generated traffic would result in significant noise or air quality changes for such receptors although there may be some short-term loss of general amenity during busier periods of HGV deliveries.

Scoped In Effects

15.32. The following aspects will be assessed when considering the effects of the Development on traffic and transportation:

- Traffic generation;
- Hazardous Loads;
- Accidents and Safety;
- Driver Delay;
- Pedestrian Amenity; and
- Severance.

Scoped Out Effects

15.33. It is proposed that a formal Transport Assessment is scoped out as the Development will not give rise to a permanent increase in traffic numbers.

15.34. On the basis of current information on construction traffic generation, it is not expected that levels of generated traffic would result in significant noise or air quality changes for residential receptors and these can be scoped out of the assessment.

15.35. During the operational phase, volumes of traffic are very limited with occasional peaks resulting from specific major maintenance activities. It is therefore proposed that operational traffic is scoped out of further assessment. Thus, the construction phase is deemed worst case and traffic relating to decommissioning can be scoped out of further assessment.

15.3 Key Questions for the Council / Consultees

15.36. The above scope is based on the requirement for EIA to consider the likely significant effects. Effects that are not likely significant do not require assessing under the EIA Regulations.

15.37. Key questions for consultees are:

- Are Consultees content with the proposed methodology and scope of the traffic and transport assessment?
- Are the Council/Statutory Consultees aware of any specific access restrictions or limitations on the proposed abnormal loads route? and
- Are Consultees content to scope out operational and decommissioning traffic from further assessment?

16. AVIATION

Introduction

16.1. Loch Toftingall Wind Farm is located in an area relatively remote from significant aviation facilities. The closest licensed aerodrome is 16 km to the east at Wick Airport. Wind turbines have the potential to affect civil and military aviation operations due to two main issues, their physical presence as potential aviation obstructions and the potential for moving turbine blades to affect the performance of navigation and surveillance systems such as radar. It is therefore necessary to undertake an assessment of any potential effects on aviation facilities.

Study Area

16.2. The assessment of effects of the Development will be based upon the guidance laid down in CAA Publication CAP 764 '*Policy and Guidelines on Wind Turbines*', Version 6 dated February 2016. The study area is informed by the consultation criteria for aviation stakeholders as defined in Chapter 4, and the recommended distances include:

- Airfield with a surveillance radar – 30 km;
- Non radar licensed aerodrome with a runway of more than 1,100 m – 17 km;
- Non radar licensed aerodrome with a runway of less than 1,100 m – 5 km;
- Licensed aerodromes where the turbines would lie within airspace coincidental with any published Instrument Flight Procedure (IFP);
- Unlicensed aerodromes with runways of more than 800 m – 4 km;
- Unlicensed aerodromes with runways of less than 800 m – 3 km;
- Gliding sites – 10 km; and
- Other aviation activity such as parachute sites and microlight sites within 3 km – in such instances, developers are referred to appropriate organisations.

16.3. CAP 764 goes on to state that these distances are for guidance purposes only and do not represent ranges beyond which all wind turbine developments will be approved, or within which they will always be objected to. These ranges are intended as a prompt for further discussion between developers and aviation stakeholders and will be reported upon in the EIA Report.

16.4. It is necessary to take into account the aviation and air defence activities of the Ministry of Defence (MOD) as safeguarded by the Defence Infrastructure Organisation (DIO). The types of issues that will be addressed in the EIA Report include:

- MOD Airfields, both radar and non-radar equipped;
- MOD Air Defence Radars;

- MOD Meteorological Radars; and
- Military Low Flying.

16.5. It is necessary to take into account the possible effects of wind turbines upon the National Air Traffic Services En Route Ltd (NERL) communications, navigation and surveillance systems – a network of primary and secondary radars and navigation facilities around the country.

16.6. As well as examining the technical impact of wind turbines on Air Traffic Control (ATC) facilities, it is also necessary to consider the physical safeguarding of ATC operations using the criteria laid down in CAP 168 '*Licensing of Aerodromes',* Version 11 dated Jan 2019, to determine whether a proposed development will breach obstacle clearance criteria. This will also be reported on in the EIA; however, initial surveys show there are no physical safeguarding issues associated with the Development.

Assessment Methodology

16.7. Radar modelling has been undertaken for the scoping layout and will be been undertaken again for the finalised layout using Wind Power Aviation Consultant's (WPAC's) 'RView' system which utilises a comprehensive systems database incorporating the safeguarding criteria for a wide range of radar and radio navigation systems. RView models terrain using the latest Ordnance Survey (OS) Terrain 50 digital terrain model, which has a post spacing of 50 m and has a root mean square (RMS) error of 4 m. The results are verified using the Shuttle Radar Topography Mission (SRTM) dataset, a separate smoothed digital terrain model with data spacing of 3 arc seconds. By using two separate and independently generated digital terrain models, anomalies are identified and consistent results assured. RView models the refractive effects of the atmosphere on radio waves and the First Fresnel Zone. A feature of RView is that as well as performing calculations in an appropriate manner, it also allows the comparison of results with results from simpler models. For example, RView can perform calculations using the true Earth Radius at the midpoint between the radar and the wind turbine or the simplified 4/3 Earth Radius model. If needed, RView is also capable of modelling a range of atmospheric refractive conditions. RView models the trajectory of radar signals at different elevations allowing us to model both volume surveillance and pencil beam radars as well as the effects of angular sterilisation as applied, for example, in Met Office radars.

Baseline Conditions

16.8. The Development is located in an area with little aviation infrastructure. The closest radar equipped civilian airport is at Inverness over 100 km to the south and the closest licensed aerodrome is at Wick, 16 km to the east. The closest military airfield is at RAF Lossiemouth, 80 km to the south. The aviation chart shows a number of existing and operating wind farms in the area.

Potential Effects and Assessment

16.9. Airfields with a surveillance radar – none within 30 km. The closest radar equipped civil airport is at Inverness, 108 km to the south. Radar modelling shows that there is no possibility of the turbines affecting the radar and consultation is not required with Highlands and Islands Airports Ltd (HIAL) in relation to Inverness Airport. Radar line of sight (RLOS) is in excess of 900 m above ground level (AGL).

16.10. Licensed Aerodromes without a surveillance radar – Wick Airport is 16 km to the east and as such is entitled to be consulted in regard to the proposed development. Initial calculations show that there is no possibility of the turbines affecting any safeguarded or protected surfaces. The Outer Horizontal Surface for Wick Airport is a circle with a radius of 10 km based on the centre of the runway, which is 1825 m long. The figure of 10 km is the promulgated radius for a runway that is less than 1860 m long as defined in CAP 168 Chapter 4. It will be necessary to consult with HIAL in relation to Wick Airport in order to confirm that the Development does not affect the instrument approach minima or pattern heights for any of the approaches. An initial assessment by WPAC shows that none will be affected.

16.11. Unlicensed Aerodromes – an extensive search of aviation charts and databases indicates that there are no unlicensed aerodromes in the region and certainly none within consultation distance.

16.12. Military Air Traffic Control Sensors – the closest MOD airfield is at RAF Lossiemouth, 83 km to the south. Radar modelling shows that RLOS at the turbine locations varies between 240 and 307 m AGL. Any turbines will therefore be screened by terrain and are unlikely to be a MOD objection in relation to military ATC. It will be necessary to model the finalised layout to confirm these figures, and this will be reported in the EIA. The MOD Defence Infrastructure Organisation (DIO) will need to be consulted to confirm their position.

16.13. Military Air Defence Radar Sensors – the closest Air Defence Radar is located 144 km to the south, at Buchan, near Peterhead. Radar modelling shows there is no possibility of the turbines affecting the radar as RLOS is in excess of 1500 m AGL. This will be confirmed by the MOD when they are consulted.

16.14. Military Low Flying – Tactical low flying takes place throughout the Highlands Restricted Area (HRA) shown in Figure 13, Appendix A with a purple hashed boundary and designated R610. The Development is well outside this area and also in an area with a significant number of existing turbines. On the MOD published low flying operations and wind farm charts the area around the Development is coloured blue, indicating an area where a low flying objection is very unlikely. This will be confirmed by the MOD when they are consulted during the planning process.

16.15. NATS En Route Ltd (NERL) – The closest NERL radar is located at Alanshill in Aberdeenshire, with a longer range radar further south at Perwinnes, adjacent to Aberdeen Airport. Radar modelling has been undertaken which

shows that there is no possibility of the turbines being visible to either radar. RLOS is in excess of 1500 m AGL. NERL will need to be consulted as part of the planning process, but there is no possibility of a radar based objection from NERL.

16.16. Met Office Radars – The Met Office safeguards its network of radars using a European methodology known as OPERA. In general they will object to any turbine within 5 km in line of sight and will examine the impact of any turbines within 20 km. Where a site is within 20 km, the Met Office will undertake an operational assessment based on three main criteria, having determined that there is a technical impact on the radar. The factors they will consider include the following:

- Proximity to Airports;
- River catchment response times; and
- Population density.

16.17. In this case the closest Met Office radar is at Hill of Dudwick in Aberdeenshire and well beyond 20 km.

Scoped In Effects

16.18. Scoped in effects include:

- Wick Airport – consultation with HIAL in relation to airport safeguarding;
- MOD -consultation to confirm that the turbines will be sufficiently screened by terrain from RAF Lossiemouth; and
- NERL – consultation to confirm that the turbines will be sufficiently screened or separated from the Communications, Navigation and Surveillance (CNS) Network.

Scoped Out Effects

16.19. Scoped out effects include:

- Inverness Airport; and
- Met Office radars.

Key Questions for Council / Consultees

- Are HIAL satisfied that the Development will be manageable in relation to operations at Wick Airport?

17. SOCIO-ECONOMICS, TOURISM AND RECREATION

Introduction

17.1. This chapter will consider the potential socio-economic, tourism and recreation effects from the Development. This includes a consideration of existing land uses within the site, local tourism activity, employment generation, and any indirect economic effects from the Development.

Study Area

17.2. The study areas that will be used in this assessment shall be Scotland and the Local Authority Area of Highland.

17.3. Where data is available for Caithness, this shall be included in the relevant parts of the socio-economic baseline section of the report.

Assessment Methodology

17.4. There is no specific legislation or guidance available on the methods that should be used to assess the socio-economic impacts of a proposed onshore wind farm development. The proposed method has however been based on established best practice, including that used in UK Government and industry reports on the sector.

17.5. Effects will be considered based on the wider environmental impact guidance from guidelines for Environmental Impact Assessments[59] and a handbook for EIA[60].

17.6. An economic impact analysis will be undertaken using the methodology developed by BiGGAR Economics, which has been used to assess over 100 onshore wind farms across the UK.

17.7. In particular this assessment will draw from two studies by BiGGAR Economics on the UK onshore wind energy sector, a report published by RenewableUK and DECC in 2012 on the direct and wider economic benefits of the onshore wind sector to the UK economy (BiGGAR Economics, 2012) and a subsequent update to this report published by Renewable UK in 2015 (BiGGAR Economics, 2015). These reports will provide the input assumptions if the data for the Development is not available.

17.8. There is also no formal legislation or guidance on the methods that should be used to assess the effects that wind farm developments may have on tourism and leisure interests. The proposed method would

59 Institute of Environmental Management and Assessment. (2004). Guidelines for Environmental Impact Assessment.
60 Scottish Natural Heritage. (2003). A Handbook for Environmental Impact Assessment, Appendix 5: Guide to Outdoor Access Assessment.

consider individual attractions and tourism facilities to assess if there could be any effects from the Development.

17.9. It is also important that the socio-economic and tourism chapter takes account of the relevant local and national policy objectives. The most relevant objectives for this are expected to be included in the following strategies:

- Scotland's Economic Strategy[61];
- Scotland's Energy Strategy[62];
- Highlands and Islands Operating Plan (2018-19)[63]
- Tourism Scotland 2020[64]; and
- Vision for Caithness and North Sutherland[65].

17.10. This will be a desk-based study and there will be no stakeholder consultations undertaken as part of this study.

Baseline Conditions

17.11. The socio-economic baseline will cover:

- The demographic profile of the local area within the context of the regional and national demographic trends;
- Employment and economic activity in the local area within the context of the regional and national economic trends;
- The industrial structure of the local area within the context of the regional and national economies;
- The role of the tourism and recreation sector in the local and regional economy; and
- Wage levels within the local economy compared to regional and national levels.

17.12. The baseline assessment shall be a desked based exercise that shall draw upon the latest published socio-economic data. This shall include, but not be limited to, the following data sets:

- Annual Business Survey – Office for National Statistics (ONS);
- Annual Population Survey – ONS;
- Annual Survey of Hours and Earnings – ONS;
- Mid-Year Population Estimates – National Records of Scotland; and
- Population Projections 2016 – 2041- National Records of Scotland.

61 Scottish Government. (2015). Scotland's Economic Strategy.
62 Scottish Government (2017), Scottish Energy Strategy: The Future of Energy in Scotland
63 Highlands and Islands Enterprise (2017), Operating Plan 2017-18
64 Scottish Tourism Alliance. (2012). Tourism Scotland 2020.
65 Caithness and North Sutherland Regeneraton Partnership. (2017). Vision for Caithness and North Sutherland.

17.13. The baseline assessment, and subsequent economic impact analysis, shall be undertaken towards the end of the EIA study period to ensure that the data is as up to date as possible.

Key Sensitivities

17.14. The key socio-economic sensitivities shall be identified during the baseline assessment and reported within the EIA Report.

Potential Effects and Assessment

Scoped In Effects

17.15. The issues that will be considered in this assessment will include the potential socio-economic, tourism and recreation effects associated with the Development.

17.16. The potential socio-economic effects that will be considered here:

- Temporary effects on the regional and/or national economy due to expenditure during the construction phase;
- Permanent effects on the regional and/or national economy due to expenditure associated with the on-going operation and maintenance of the development;
- Permanent effects on the local economy as a result of any additional public expenditure that could be supported by the additional tax revenue that would be generated by the development during the operational phase;
- Permanent effects on the local economy that could be supported by any community funding that might be provided by the applicant during the operational phase; and
- Temporary effects on the regional and/or national economy due to expenditure during the decommissioning phase.

17.17. The link between onshore wind energy developments and the tourism sector is a subject of debate; however, the most recent research has not found a link between tourism employment, visitor numbers and onshore wind development. For example, in 2017 BiGGAR Economics published an updated study[66] that considered 28 wind farms constructed between 2009 and 2015 and the trends in tourism employment in the areas local to these developments. The analysis found that there was no relationship between the development of onshore wind farms and tourism employment at the level of the Scottish economy, at local authority level nor in the areas immediately surrounding wind farm developments.

17.18. Nevertheless, the tourism and recreation sector is an important contributor to the local and Scottish economies and so there is merit in considering whether the Development will have any effect on the tourism

66 BiGGAR Economics. (2017). Wind Farms and Tourism Trends in Scotland: A Research Report.

and recreation sector. This assessment will consider the potential effect that the development could have on tourism attractions, routes, trails and local accommodation providers.

Scoped Out Effects

17.19. Effects that are not described in the 'Scoped In Effects' section above, have been scoped out of this assessment.

Key Questions for Council / Consultees

17.20. The key questions for the Statutory Consultees are:

- Do the Statutory Consultees agree with the proposed method of assessment?
- Are the Statutory Consultees aware of any additional sensitive economic activities in the area that would not be covered in the proposed method of assessment?

18. SHADOW FLICKER

Introduction

18.1. Reflectivity is the potential for the sun to 'glint' off structures which, in the case of wind turbines, can be an intermittent glint when the turbines are rotating. This effect can be minimised by selecting a matt coating for the wind turbines, designed to reduce the potential for reflection and is therefore scoped out of further assessment.

18.2. Under certain combinations of geographical position and time of day, the sun may pass behind the rotors of a wind turbine and cast a shadow over neighbouring properties. Shadow flicker is an effect that can occur when the shadow of a blade passes over a small opening (such as a window), briefly reducing the intensity of light within the room and causing a flickering to be perceived. Shadow flicker effects only occur inside buildings where the blade casts a shadow across an entire window opening.

Methodology

18.3. Due to the lack of explicit guidance in Scotland, guidance within England is considered to be material for assessing shadow flicker effects. Guidance produced by the UK Government, Planning Practice Guidance for Renewable and Low Carbon Energy[67] states that "*only properties within 130 degrees either side of north, relative to the turbines can be affected at these latitudes in the UK- turbines do not cast long shadows on their southern side*". In addition, the Scottish Government Online Planning Guidance note on onshore wind[68] provides information on shadow flicker. It states: "*Where separation is provided between turbines and nearby dwellings (as a general rule 10 rotor diameters), "shadow flicker" should not be a problem*". However, the Council states that wind energy developments should be "*located a minimum distance of 11 times the blade diameter of the turbines from any regularly occupied buildings not associated with the development. Within a distance less than 11 times the blade diameter, a shadow flicker assessment will be required[69].*" This increase in distance from the established 10 is to account for northern latitudes in the Highlands and is in line with the conclusions of the DECC Update of UK Shadow Flicker Evidence[70].

[67] DCLG (2013) Planning Practice Guidance for Renewable and Low Carbon Energy. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/225689/Planning_Practice_Guidance_for_Renewable_and_Low_Carbon_Energy.pdf [Accessed 01/03/2018]

[68] Scottish Government (2014) Onshore wind turbines: planning advice. Available at https://www.gov.scot/publications/onshore-wind-turbines-planning-advice/ (Accessed 1/3/19)

[69] The Highland Council (2019) Onshore Wind Energy: Supplementary Guidance. Available at https://www.highland.gov.uk/downloads/file/18793/onshore_wind_energy_supplementary_guidance_november_2016 (Accessed 12/4/2019)

[70] DECC (2011) Update of UK Shadow Flicker Evidence Base [Online] Available at: https://www.gov.uk/government/publications/update-of-uk-shadow-flicker-evidence-base (Accessed 23/03/2019)

18.4. An assessment will be undertaken to determine whether or not there will be any shadow flicker effects at properties surrounding the Site. This assessment will examine all properties which lie within 11 rotor diameters and 130° either side of north from each turbine. Effects will be quantified using a computer model during the EIA process and mitigation, if required, will be outlined.

Key Questions for Council / Consultees

18.5. The above scope is based on the requirement for EIA to consider the likely significant effects. Effects that are not likely significant do not require assessing under the EIA Regulations.

18.6. Key questions for consultees are:

- Should no properties fall within eleven rotor diameters and 130 degrees of north of the Development, are consultees content that shadow flicker can be scoped out of the EIA?

19. TELECOMMUNICATIONS AND UTILITIES

Introduction

19.1. Wind farms have the potential to interfere with electro-magnetic signals passing above ground and physically with existing infrastructure below ground. This can therefore potentially affect television reception, fixed telecommunication links and other utilities.

Methodology

19.2. To identify any existing infrastructure constraints, a desk-based study as well as consultation will be conducted. Consultation with relevant telecommunication and utilities providers is a routine part of wind farm development and consultees will include:

- Spectrum licensing/ OFCOM;
- Television and telecommunications providers as appropriate; and
- Water, gas and electricity utilities providers.

19.3. Initial consultation has been undertaken, as follows:

- JRC has identified two radio links that may potentially be affected by the Development;
- Arqiva has identified two links within 2.5 km of the Development;
- Atkins identified no links affected by the Development.

19.4. Further consultation will be completed to establish the baseline to inform the assessment and throughout the design process and EIA.

Scoped In Effects

19.5. An assessment of the effect of the Development upon telecommunications will be included within the EIA Report.

Scoped Out Effects

19.6. Since the introduction of digital television signals, effects on television reception have substantially reduced. Should effects upon reception be identified as a result of the Development, mitigation is available to ensure these effects are not significant. As such, effects on television reception are considered extremely unlikely and are scoped out of the EIA.

19.7. The Development will be designed to ensure that there are no effects on utilities and further consultation will be undertaken prior to construction to ensure there are no effects. As such, utilities are scoped out of further assessment.

Key Questions for Consultees

19.8. The above scope is based on the requirement for EIA to consider the likely significant effects. Effects that are not likely to be significant do not require assessment under the EIA Regulations.

19.9. Key questions for consultees are:

- Are consultees aware of any additional telecommunication or utility stakeholders that should be taken into account?
- Are consultees content that effects upon television reception and utilities can be scoped out of the EIA?

20. HEALTH AND SAFETY

Introduction

20.1. The EIA Regulations state than an EIA must identify, describe and assess in an appropriate manner, the expected effects deriving from the vulnerability of the development to risks, so far as relevant to the development, of major accidents and natural disasters.

Methodology

20.2. Directive 2012/18/EU of the European Parliament[71] relates to the control of major-accident hazards involving dangerous substances. The Directive lays down rules for the prevention of major accidents which might result from certain industrial activities and the limitation of their consequences for human health and the environment. Directive 2012/18/EU requires the preparation of emergency plans and response measures, and documents equivalent to these will be prepared prior to construction. Throughout all phases of the Development, cognisance would be made of the following guidance documents produced by Renewable UK:

- Wind Turbine Safety Rules Third Edition[72];
- Guidance & Supporting Procedures on the Application of Wind Turbine Safety Rules Third Edition[73]; and
- Onshore Wind Health & Safety Guidelines[74].

20.3. Health and Safety during the construction and decommissioning phases of the Development will be subject to relevant legislation and best practice. This will involve site inductions, risk assessment and method statements implemented by the Construction Environmental Management Plan (CEMP). The risk of a major accident could be increased by the probability of natural disasters associated with the location of the Development. This should be considered during the preparation of major-accident scenarios.

20.4. The Development is not located within an area known for natural disasters such as floods, hurricanes, tornadoes, volcanic eruptions, earthquakes or tsunamis. As the most probable of natural disasters to affect the Development, flood risk will be assessed within the hydrological assessment in the EIA Report. It is noted that the Development is not located in an area prone to flood risk.

[71] European Union (2012) Directive 2012/18/EU. Available at: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32012L0018&from=en [Accessed 20/03/19]
[72] Renewable UK (2015) Wind Turbine Safety Rules, Third Edition. Available at: https://c.ymcdn.com/sites/www.renewableuk.com/resource/resmgr/Docs/Health_&_Safety/WindTurbineSafetyRulesIssue3.pdf [Accessed 20/03/19]
[73] Renewable UK (2015) Guidance & Supporting Procedures on the Application of Wind Turbine Safety Rules, Third Edition. Available at: https://c.ymcdn.com/sites/www.renewableuk.com/resource/collection/AE19ECA8-5B2B-4AB5-96C7-ECF3F0462F75/Wind-turbine-safety-rules-guidance.pdf [Accessed 20/03/19]
[74] Renewable UK (2015) Onshore Wind Health & Safety Guidelines. Available at: http://c.ymcdn.com/sites/www.renewableuk.com/resource/collection/AE19ECA8-5B2B-4AB5-96C7-ECF3F0462F75/OnshoreWind_HealthSafety_Guidelines.pdf [Accessed 20/03/19]

20.5. None of the identified climate change trends listed will affect the Development with the exception of increased windstorms. Brake mechanisms installed on turbines allow them to be operated only under specific wind speeds and should severe windstorms be experienced then the turbines would be shut down. Although an unlikely event in the area, the brake mechanism could also apply to a hurricane scenario.

20.6. Whilst unlikely to occur in Scotland, ice throw is a phenomenon which can occur when ice, which builds up on the blades, is dislodged when the blades begin to turn. Modern turbines are fitting with sensors which can shut the turbine down during icy conditions to prevent ice throw, thereby negating the need for concern.

20.7. Appropriate health and safety protocol will be implemented to minimise the occurrence of any major accidents. Infrastructure will be placed outwith flood zones to mitigate the likelihood of flooding and breaking mechanisms will be installed to allow shut down of the turbines during severe windstorms.

20.8. Consideration of health and safety, including the potential for major accident or natural disasters, will be included within the EIA Report.

Key Questions for Consultees

20.9. Key questions for consultees are:

- Do consultees agree with the suggested approach regarding Human Health including Accidents and Disasters?

21. CLIMATE CHANGE AND CARBON BALANCE

Introduction

21.1. The aim of the Climate Change Impact Assessment (CCIA) will be to determine how the Development is likely to interact with a changing climate and whether any significant effects could arise. CCIA one of the assessment topics which must be given consideration as required by the amended EC Directive 2014/52/EU[75].

21.2. The purpose of the Development will be to produce electricity from a renewable source, the wind, thereby displacing carbon dioxide (CO_2) and other GHG emissions that would occur through the production of the equivalent amount of electricity from fossil fuel sources. The EIA will consider the current electricity generation mix and assess the level of CO_2 savings that could potentially be made depending on the source of electricity generation the wind farm is displacing at any given time.

21.3. CO_2 emissions can also be generated from the degradation of peatland should a wind farm be constructed in peatland habitat, as peat-based soils can act as carbon sinks or carbon sources depending on how they are managed. Given that peat is present on the Site, the potential effects associated with construction on peatland would be considered as part of this chapter.

Methodology

21.4. In 2017, IEMA published the 'Environmental Impact Assessment Guide to Assessing Greenhouse Gas Emissions and Evaluating their Significance'[76]. Accordingly, the proposed CCIA methodology was developed in line with the 2017 IEMA guidance, in order to establish a comprehensive assessment methodology. The methodology focusses on the following elements:

- Assessment of the Development's effects on climate change (calculation of carbon footprint based on best practice guidelines, e.g. Scottish Government Carbon Calculator Tool[77]) to include calculation of GHG emissions relating to construction, operation, decommissioning and the production of electricity;
- Assessment of the Development's vulnerabilities and resilience in the context of climate change by identifying appropriate climate change projections and climate change effects; and

[75] European Commission (2014) Directive 2014/52/EU on the assessment of the effects of certain public and private projects on the environment [Online] Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32014L0052 (Accessed 05/03/2019)
[76] IEMA (2017) Assessing Greenhouse Gas Emissions and Evaluating their Significance [Online] Available at: https://www.iaia.org/pdf/wab/EIA%20Guide_GHG%20Assessment%20and%20Significance_IEMA_16May17.pdf (Accessed 05/03/2019)
[77] Scottish Government (2018) Carbon Calculator Toll v1.4.0. Available at: https://informatics.sepa.org.uk/CarbonCalculator/index.jsp [Accessed 06/02/18]

- Assessment of the Development's effects upon identified environmental receptors in the context of the emerging baseline.

Baseline and Potential Effects

21.5. The most recent climate change projections, UKCP18[78] have identified the following climatic trends as a result of climate change:

- Increased temperature;
- Changes in the frequency, intensity and distribution of rainfall events (e.g. an increase in the contribution to winter rainfall from heavy precipitation events and decreases in summer rainfall);
- Increased windstorms; and
- Sea level rise.

21.6. Potential effects include:

- Offset of Greenhouse Gas Emissions;
- Disruption of Development operations as a result of increase in temperatures, storms, flooding, etc.; and
- Effects of climate change on assessments made under other EIA topics.

21.7. The Development will be inherently designed to reduce adverse climate change effects by offsetting the production of carbon dioxide through use of renewable sources for generating electricity. The current baseline with respect to GHG emissions from existing methods of electricity generation will be identified using existing data from the Government, operational sites, and experience of other similar developments. This information will provide the baseline information against which to assess the contribution of the Development to reducing greenhouse gas emissions and the potential for significant effects.

Key Questions for the Council / Consultees

21.8. Key questions for consultees are:

- Are consultees content with the proposed method of assessment?

[78] Met Office (2018) UK Climate Projections. Available at https://www.metoffice.gov.uk/research/collaboration/ukcp (Accessed 26/03/2019)

22. CUMULATIVE EFFECTS

22.1. At the time of writing it is known that there are several other operational wind farms and a number of wind energy proposals in the area. The methodology adopted for assessing the cumulative effects of wind energy developments will be in accordance with advice from SNH and THC. Cumulative effects, which are the combined effects of two or more wind energy developments, will, where appropriate, be considered for each technical area assessed within the EIA Report.

22.2. The extent of any cumulative assessment relative to each technical assessment will be agreed during the consultation process and can include both existing and proposed wind farm developments and other forms of development. The potential landscape and visual effects, for example, which relate to the intervisibility of an individual wind farm development scheme, will be much more wide ranging than noise effects which will be limited to receptors in the more immediate vicinity of the Development.

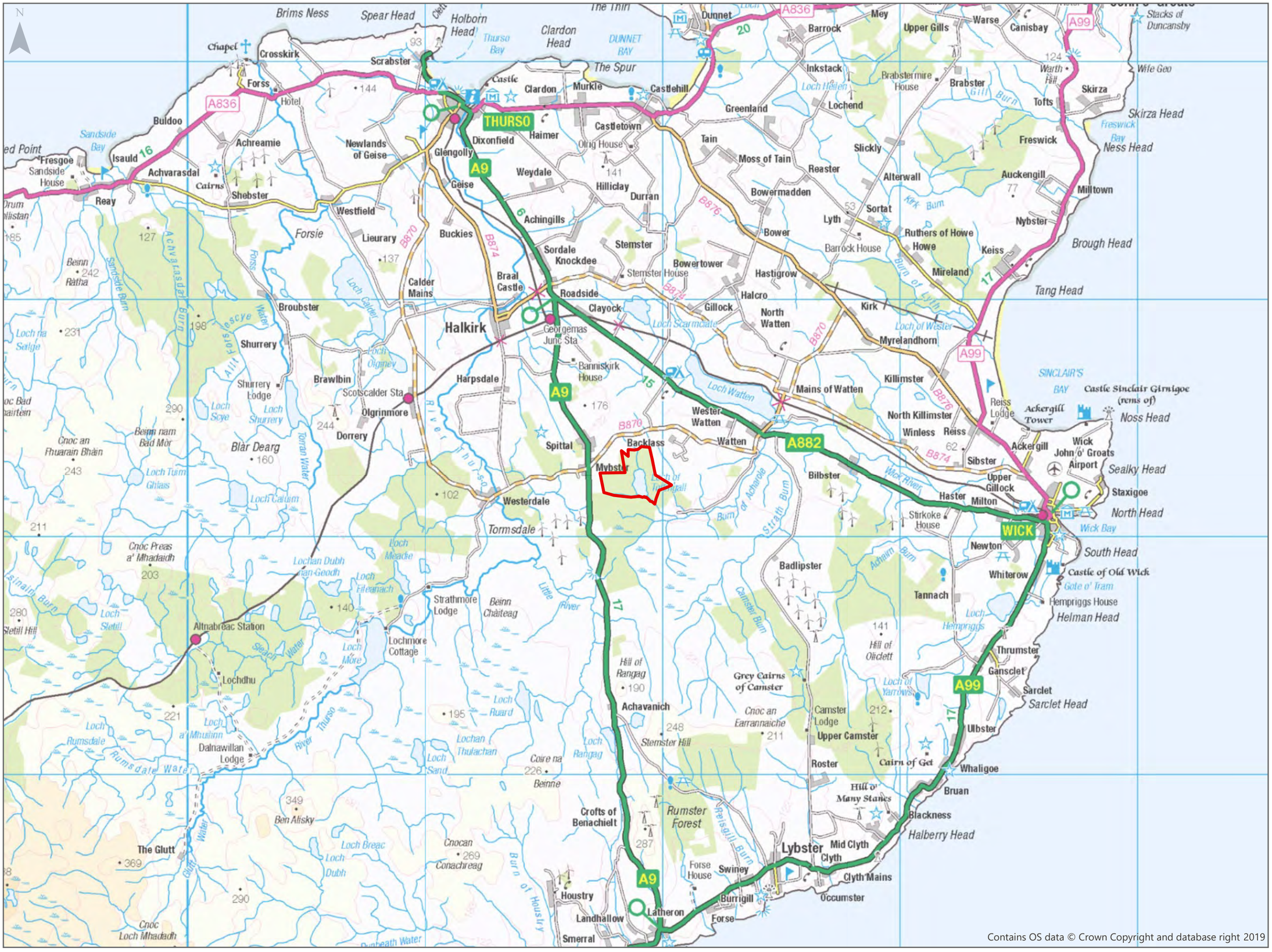
22.3. In relation to some of the technical assessments, specific guidance and policy exists advising that effects associated with existing wind farm developments should be considered cumulatively.

22.4. An initial list of cumulative sites located within 35 km of the Site is located in Appendix C.

APPENDIX A – FIGURES

Figure 1: Site Location

INFINERGY



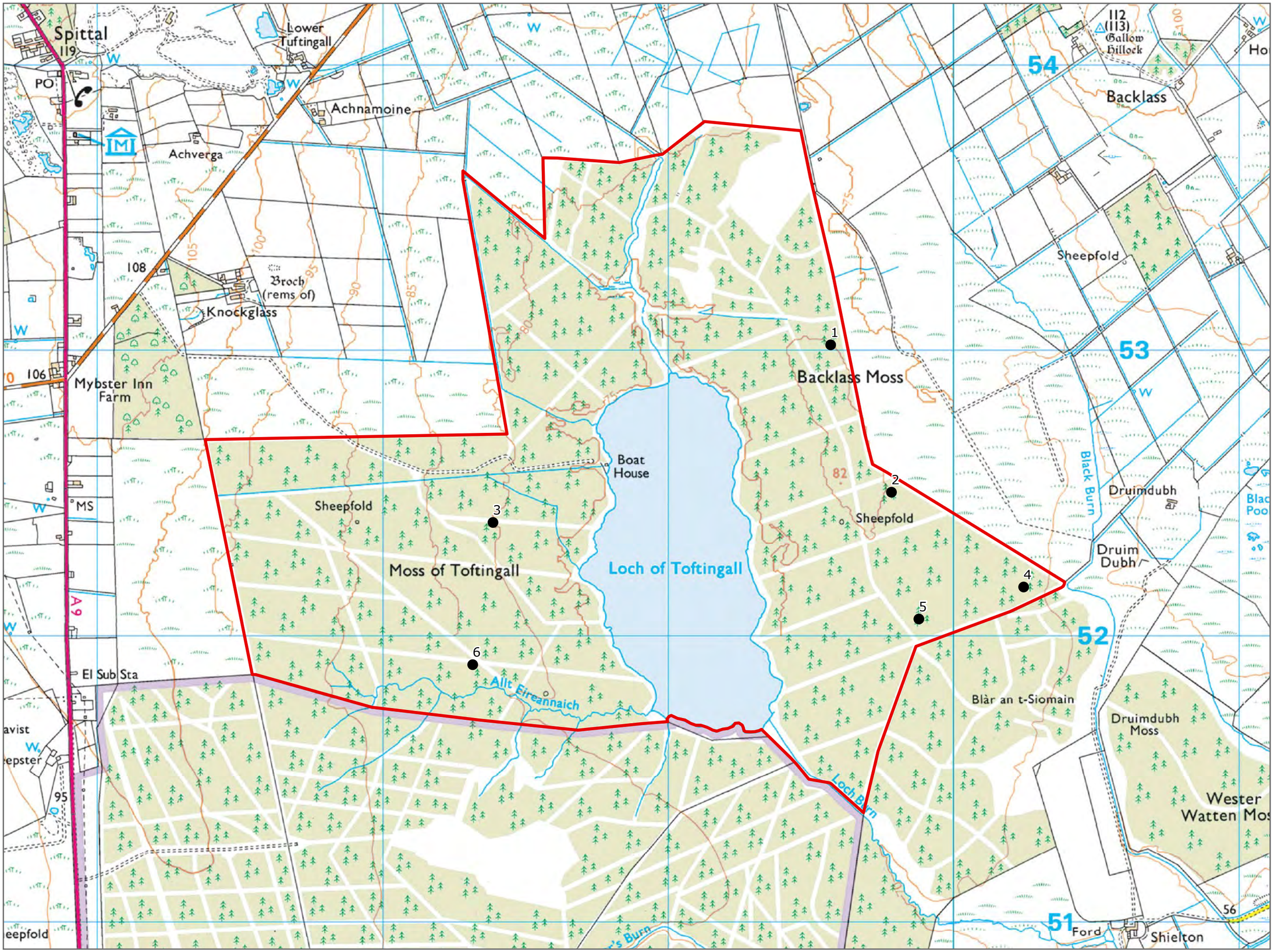
Legend:

Site Boundary

Title:	Site Location
	Loch Toftingall Wind Farm Scoping Report
Source:	© Crown copyright and database rights 2019 Ordnance Survey 0100031673
Client:	Infinergy
Drawn by: SC	**Checked:** HK
Date: 30/04/2019	**Figure:** 1.0
Scale: 0 1 2 km	**Revision No:** 1

INFINERGY

INFINERGY



Legend:

- Site Boundary
- Proposed Turbine Location

Title: Turbine Layout	
Loch Toftingall Wind Farm Scoping Report	
Source: © Crown copyright and database rights 2019 Ordnance Survey 0100031673	
Client: Infinergy	
Drawn by: JO	**Checked:** HK
Date: 30/04/2019	**Figure:** 2
Scale: 0 100 200 m	**Revision No:** 1

INFINERGY

Lochend Wind Farm
Stroupster Wind Farm
Baillie Wind Farm
Limekiln Wind Farm (Resubmission)
Achlachan Wind Farm I & II
Cogle Moss Wind Farm
Bilbster Wind Farm
Achairn Wind Farm
Wathegar I&II Wind Farms
Causeymire Wind Farm
Halsary Wind Farm
Bad a Cheo Wind Farm
Camster Wind Farm
Rumster Community Wind Energy Project
Golticlay Wind Farm
Burn of Whilk Wind Farm
Buolfruich Wind Farm
20km
15km
10km
5km

KEY:

- Site Boundary
- Study Area Radius

Other wind farms within 20km

- Operational
- Consented / Under Construction
- In Planning Schemes

0 500 1000 1500 2000 2500m

Pegasus Group

Title: Cumulative Developments	
Loch Toftingall Wind Farm	
Source: © Crown copyright and database rights 2019 Ordnance Survey 100020449	
Client: Infinergy	
Drawn by: TH	**Checked:** DT
Date: May 2019	**Figure:** 3
Scale: 1:170,000 @ A3	**Revision:** P19-0063.003A

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Dunnet Head

39. East Halladale Flows

Flow Country and Berriedale Coast

36. Causeymire Knockfin Flows

5km

10km

15m

20m

KEY:

- Site Boundary
- Study Area Radius
- Wild Land Area
- Special Landscape Area

0 500 1000 1500 2000 2500 m

Pegasus Group

Title:
Landscape Designations

Loch Toftingall Wind Farm

Source: © Crown copyright and database rights 2019 Ordnance Survey 100020449

Client: Infinergy

Drawn by:	Checked:
TH	DT
Date: May 2019	**Figure:** 4
Scale: 1:280,000 @ A3	**Revision:** P19-0063.002

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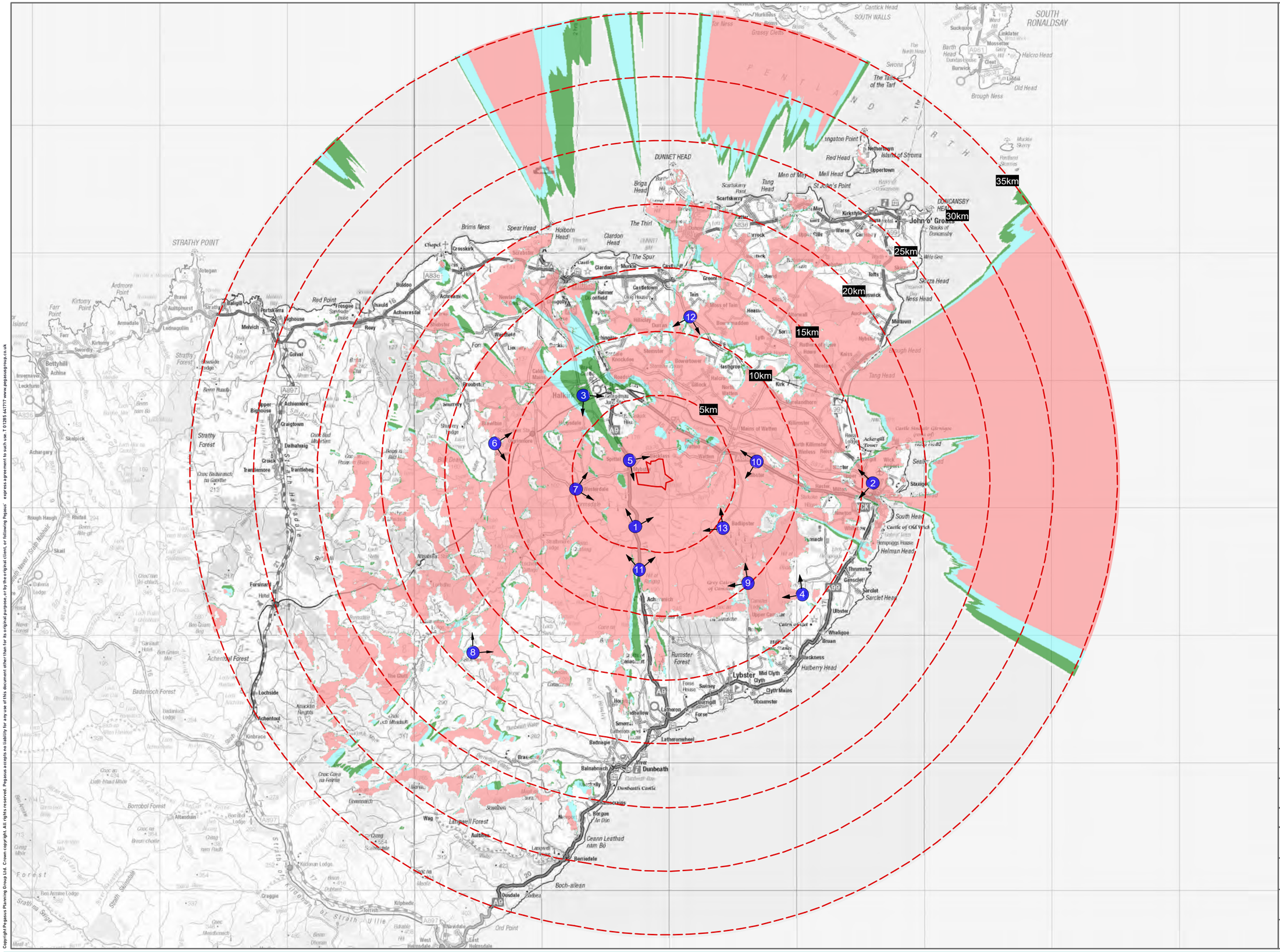
Figure 5: Blade Tip Zone of Theoretical Visibility (ZTV) with Viewpoints

INFINERGY



KEY:

- Site Boundary
- Study Area Radius
- Viewpoint Locations

Viewpoint locations

1 - A9, Memorial
2 - North Wick, A99
3 - Halkirk, south end
4 - Loch of Yarrows Archaelogical Trail
5 - A9 Spittal
6 - Ben Dorrery
7 - Westerdale
8 - Ben Aisky
9 - The Grey Cairns of Camster
10 - A882, east of Watten
11 - First view north from A9 south
12 - North of Hoy on B876
13 - Minor road north of Grey Cairns of Camster

ZTV to 138.5m Blade Tip

- 1 to 2 Turbines Visible
- 3 to 4 Turbines Visible
- 5 to 6 Turbines Visible

NB The Zone of Theoretical Visiblity (ZTV) image illustrates the theoretical extent of where turbines will be visible from assuming 100% visibility. It is generated using terrain data only and does not take into account any screening that vegetation or the built environment may provide. It is 'as such' a worst case ZTV and the actual extents of visibility are likely to be much less extensive.

Pegasus Group

Title:
Blade Tip Zone of Theoretical Visibility (ZTV) with Viewpoints

Loch Toftingall Wind Farm

Source: © Crown copyright and database rights 2019 Ordnance Survey 100020449

Client: Infinergy	
Drawn by: TH	**Checked:** DT
Date: May 2019	**Figure:** 5
Scale: 1:280,000 @ A3	**Revision:** P19-0063.001

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Figure 6: Ecological Designations

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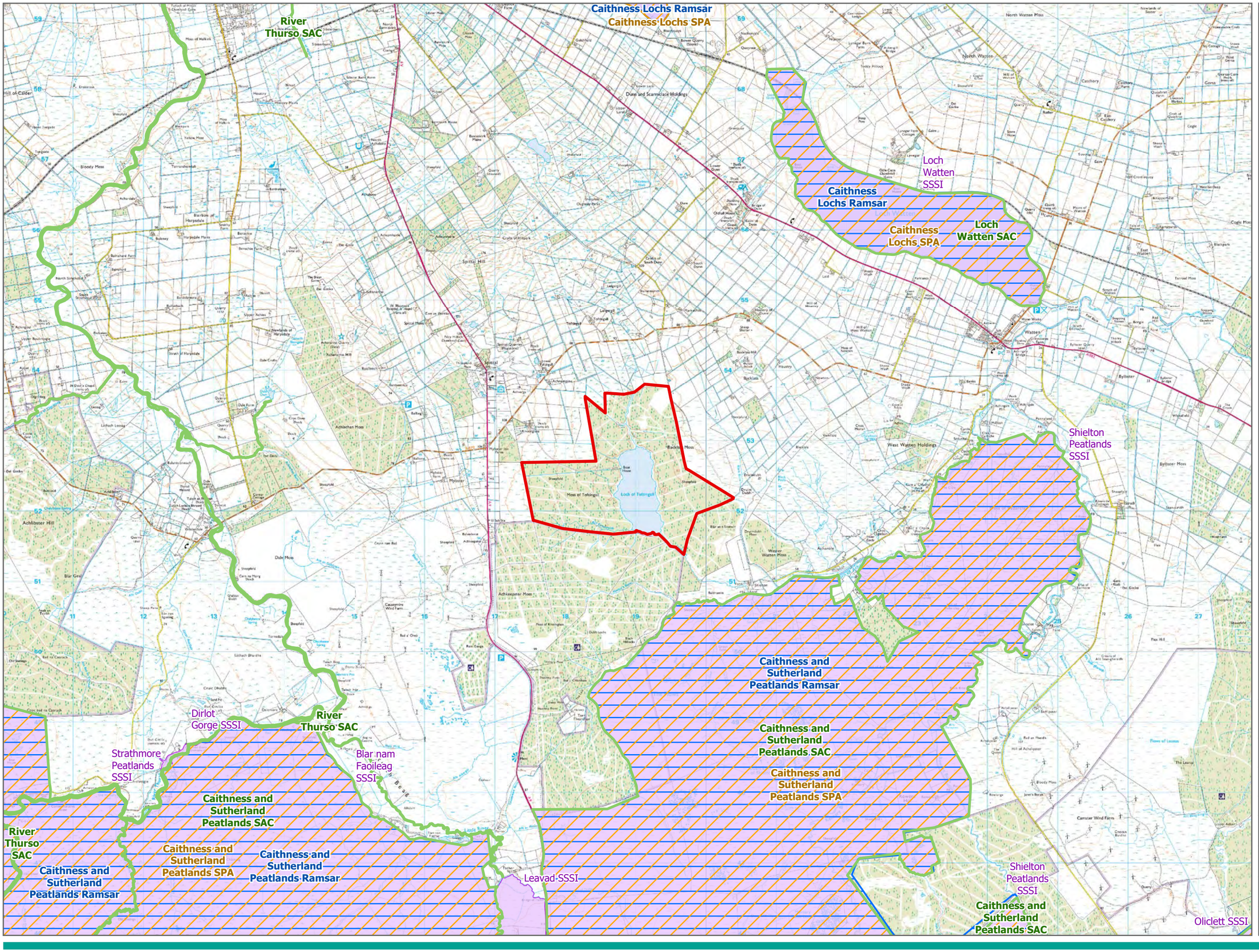

Legend:

- Site Boundary
- Ramsar Sites
- SSSI
- Special Protection Areas
- Special Areas of Conservation

Title: Ecological Designations	
Loch Toftingall Wind Farm Scoping Report	
Source: © Crown copyright and databse rights 2019 Ordnance Survey 0100031673	
Client: Infinergy	
Drawn by: SC	**Checked:** HK
Date: 10/04/2019	**Figure:** 6
Scale: 0 0.5 1 km	**Revision No:** 1

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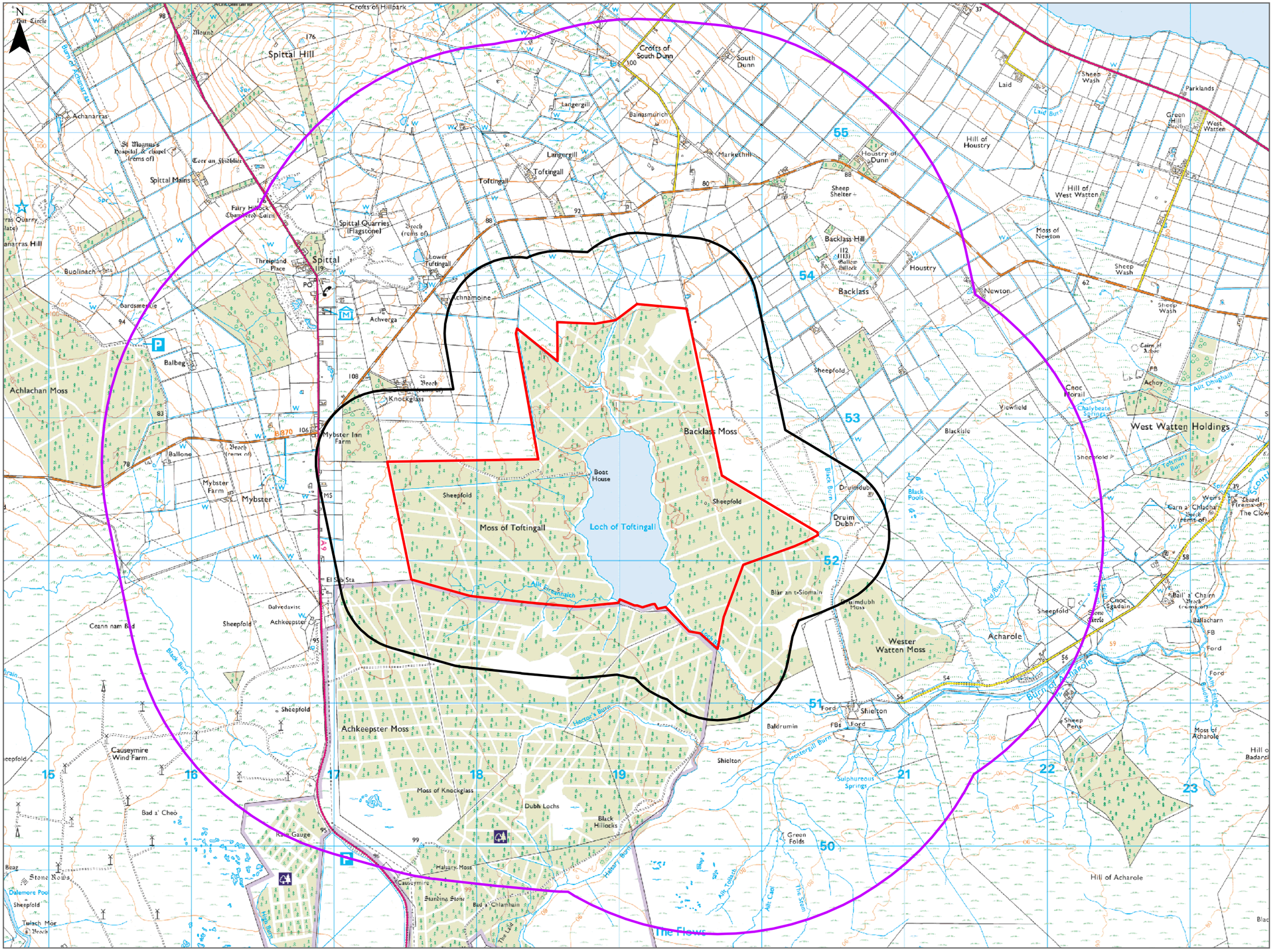
Figure 7: Ornithology Scoping Buffers



Legend:

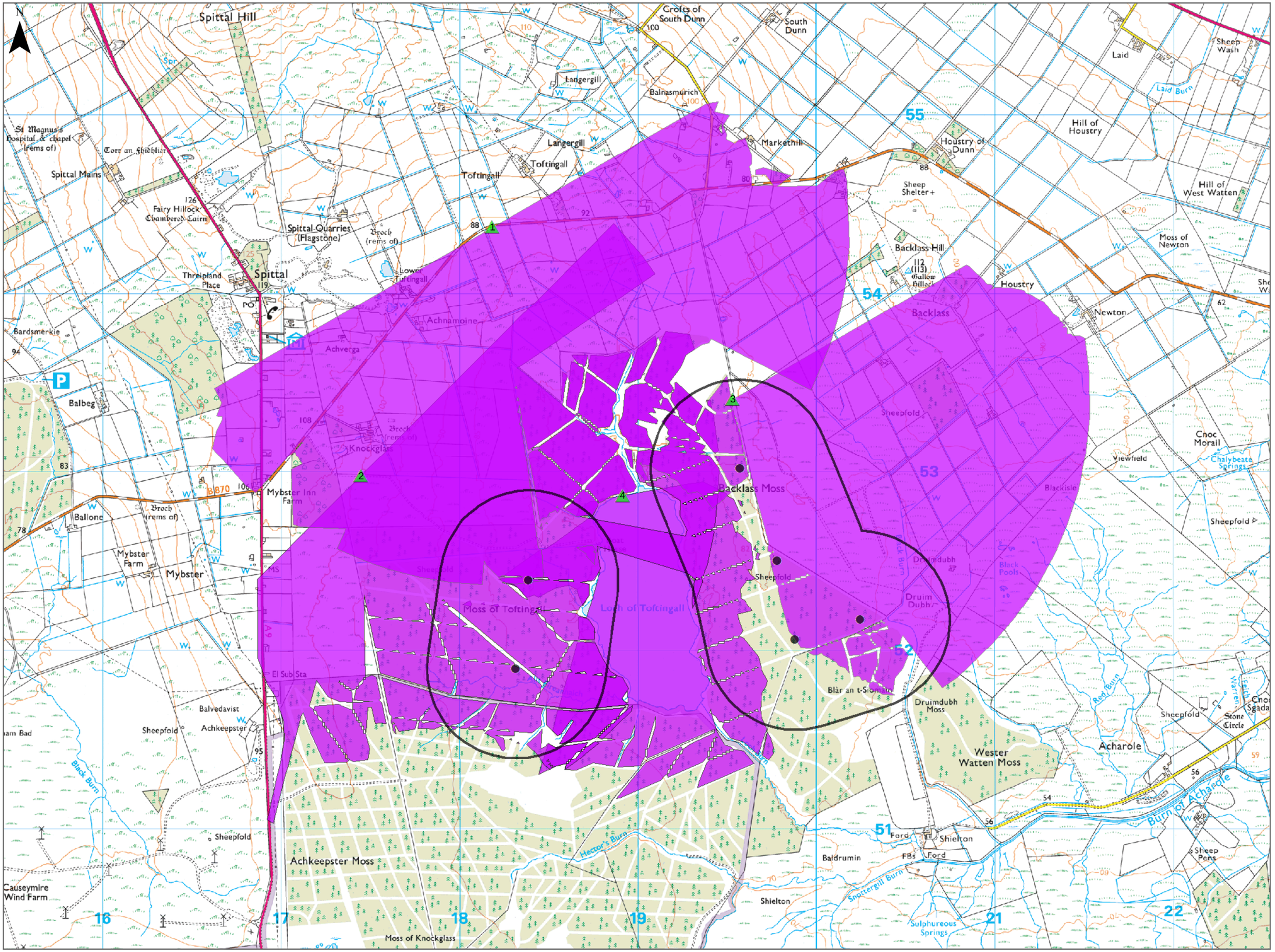
- Application boundary
- 500m buffer
- 2km buffer

Title: Ornithology Scoping Buffers	
Loch Toftingall Wind Farm	
Source: © Crown copyright and database rights 2019 Ordnance Survey 0100031673	
Client: Infinergy	
Drawn by: DS	**Checked:** HK
Date: 26/04/2019	**Figure:** 7
Scale: 0 0.5 km	**Revision No:** 0

INFINERGY

Figure 8: Ornithology VPs and Viewsheds

INFINERGY



Legend:

- Proposed Turbine
- Flight activity area
- VP location
- Viewshed

Title: Ornithology VPs and Viewsheds	
Loch Toftingall Wind Farm	
Source: © Crown copyright and database rights 2019 Ordnance Survey 0100031673	
Client: Infinergy	
Drawn by: DS	**Checked:** HK
Date: 26/04/2019	**Figure:** 8
Scale: 0 0.25 km	**Revision No:** 0

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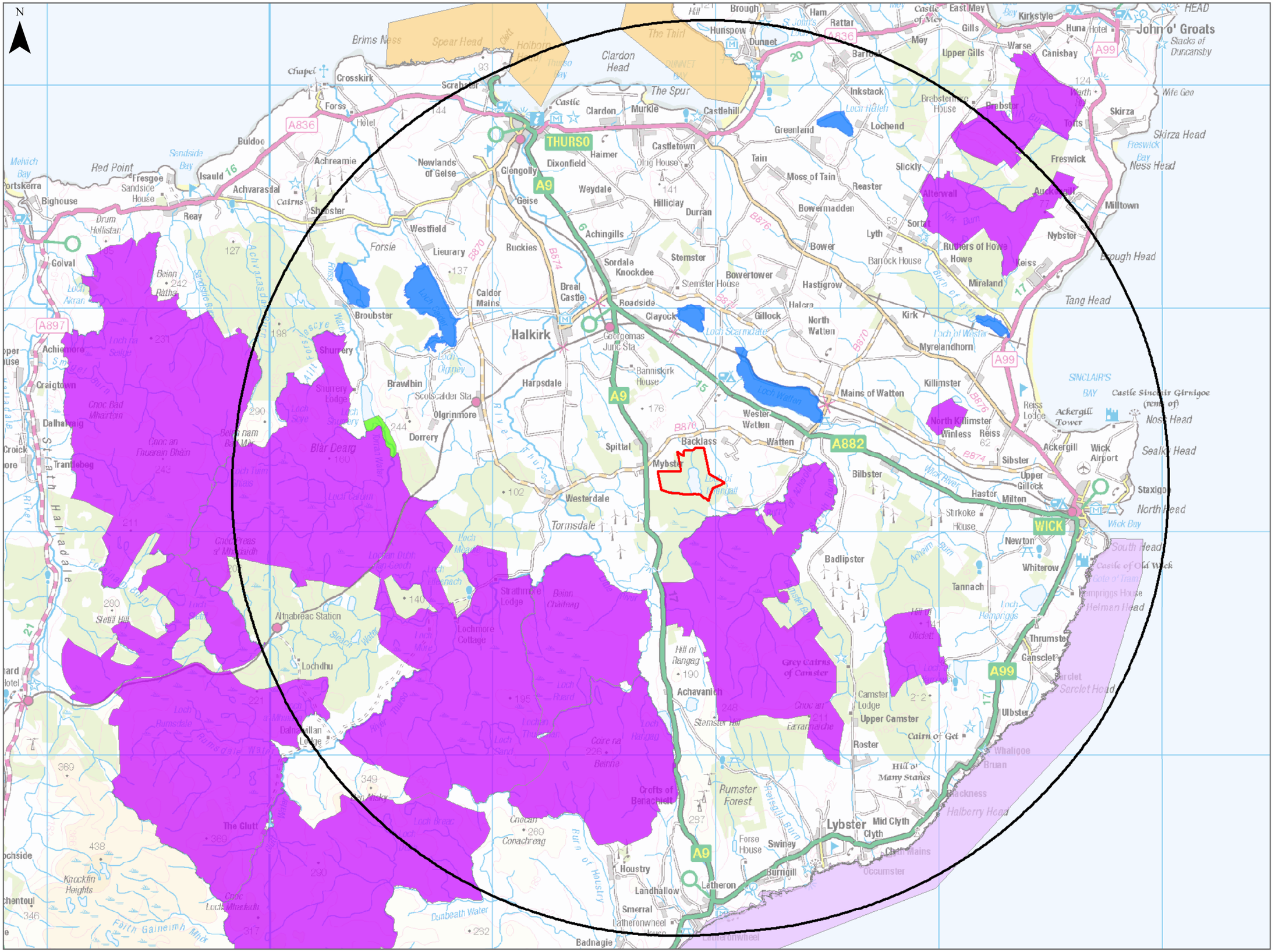
INFINERGY



Legend:

- Application boundary
- 20km buffer

SPA

- Caithness Lochs
- Caithness and Sutherland Peatlands
- East Caithness Cliffs
- North Caithness Cliffs

SSSI

- Lambsdale Leans

Title:	Ornithology Designations
	Loch Toftingall Wind Farm
Source:	© Crown copyright and database rights 2019 Ordnance Survey 0100031673
Client:	Infinergy
Drawn by: DS	**Checked:** HK
Date: 26/04/2019	**Figure:** 9
Scale: 0 2.5 km	**Revision No:** 0

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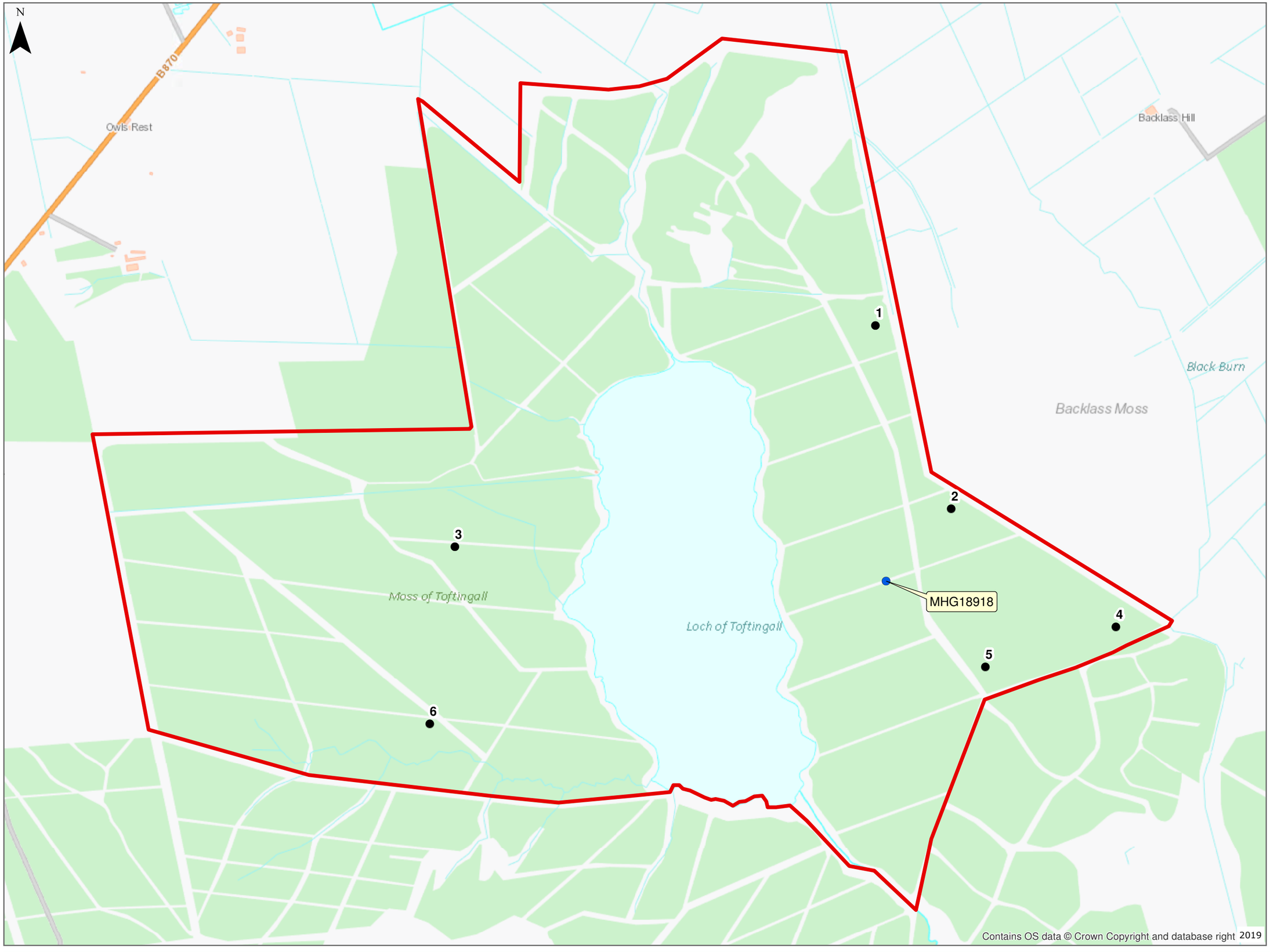
Figure 10: Heritage Assets in the Inner Study Area

INFINERGY



Legend:

- Heritage Asset
- Toftingall Scoping Turbine
- Planning Boundary

Title:	Scoping Report
	Loch Toftingall Wind Farm
Source:	© Crown copyright and database rights 2019 Ordnance Survey 0100031673
Client:	Infinergy
Drawn by: TJ	**Checked:** HK
Date: 21/05/2019	**Figure:** 10
Scale: 0 0.15 km	**Revision No:** 1

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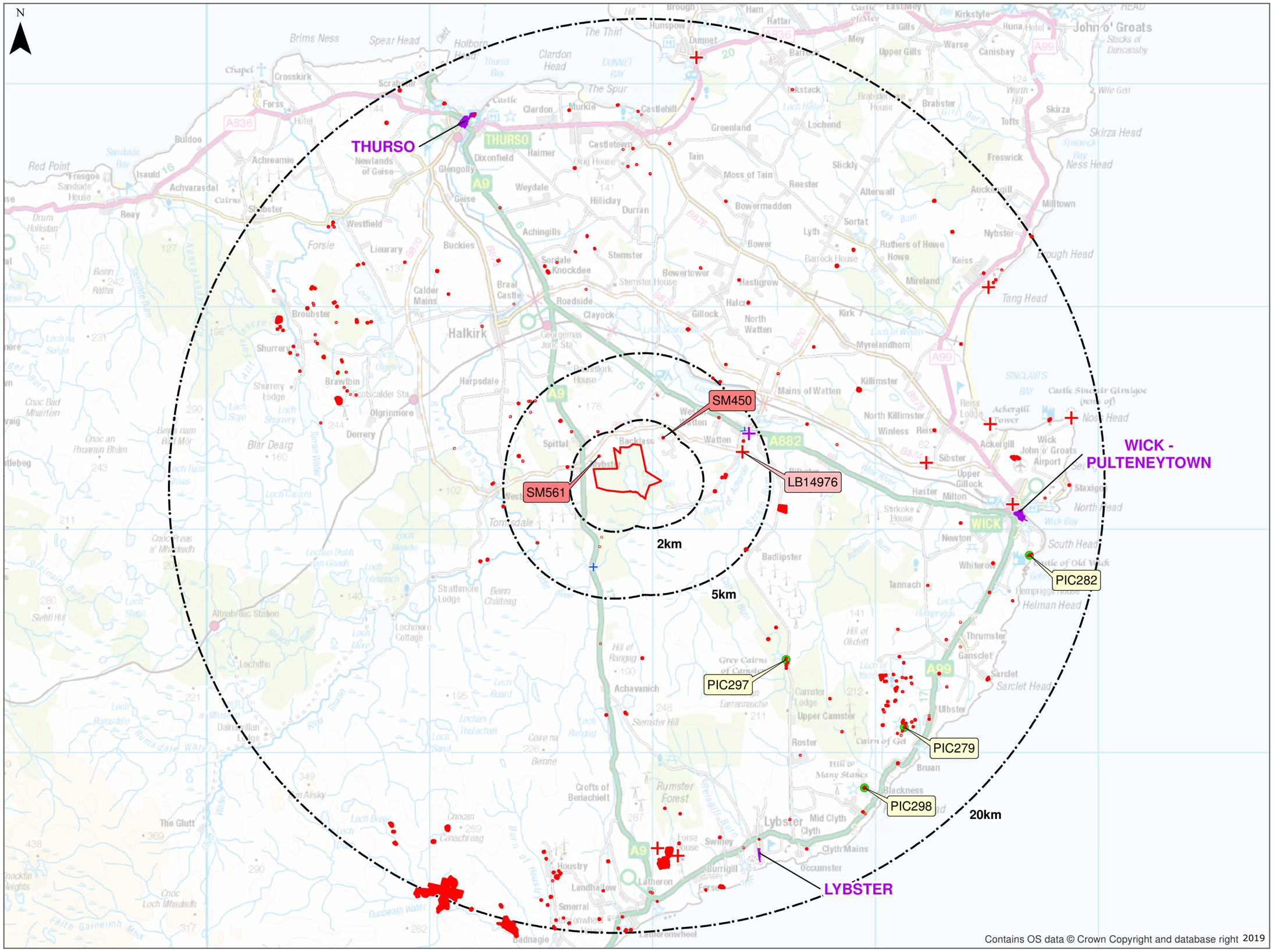
Figure 11: Designated Heritage Assets in the Outer Study Area

INFINERGY



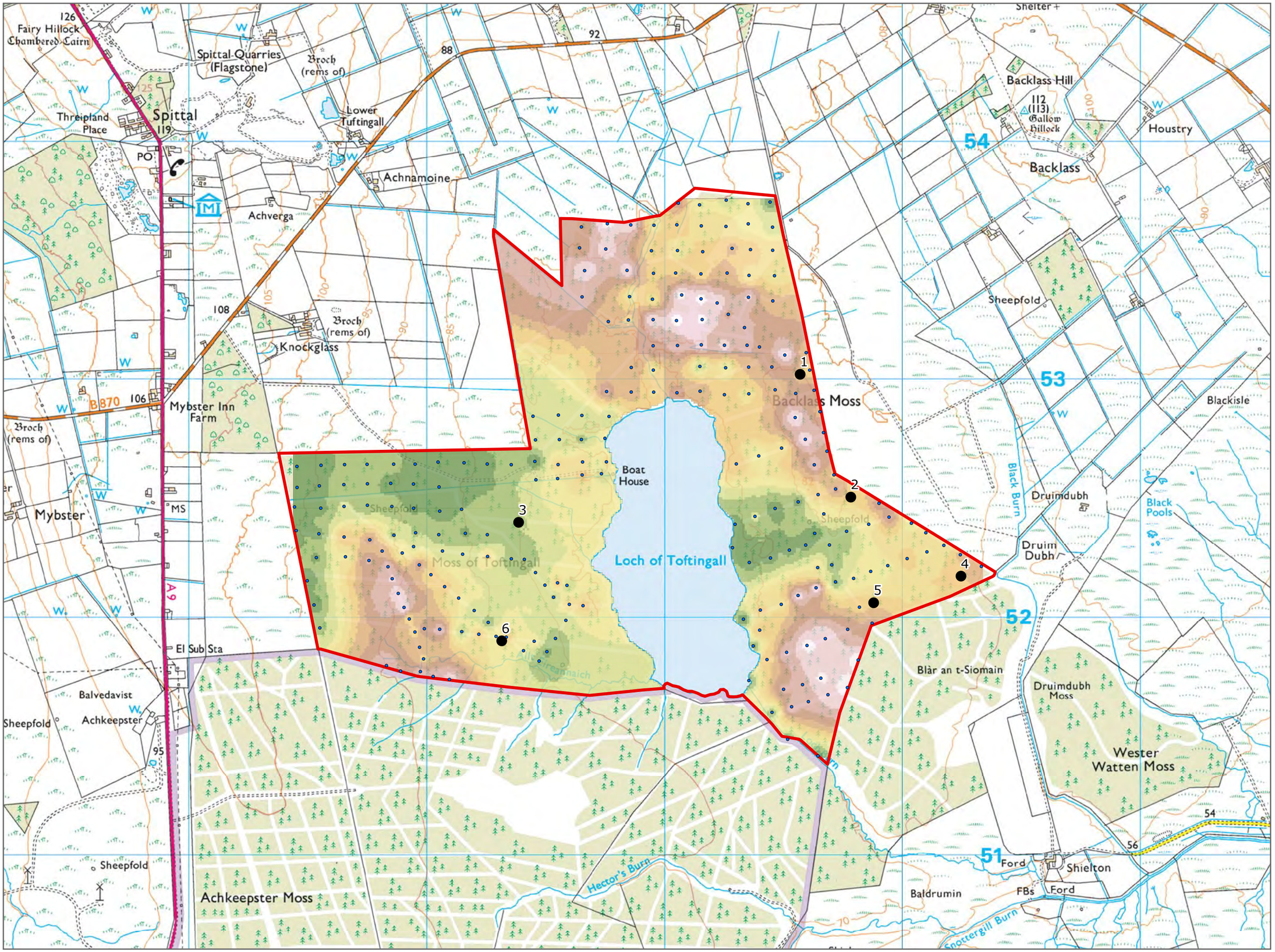
Legend:

- Property in Care
- Scheduled Monument
- Category A Listed Building
- Category B Listed Building
- Category C Listed Building
- Conservation Area
- Distance from Turbines
- Planning Boundary

Title:	Scoping Report
	Loch Toftingall Wind Farm
Source:	© Crown copyright and databse rights 2019 Ordnance Survey 0100031673
Client:	Infinergy
Drawn by: TJ	**Checked:** HK
Date: 21/05/2019	**Figure:** 11
Scale: 0 1.5 3 Km	**Revision No:** 1

INFINERGY

INFINERGY



Legend:

- Site Boundary
- Proposed Turbine Location
- Peat Probe Locations

Peat Depth Interpolation (m)

- 0 - 0.50
- 0.51 - 1.00
- 1.01 - 1.50
- 1.51 - 2.00
- 2.01 - 2.50
- 2.51 - 3.00
- 3.01 - 3.50
- 3.51 - 4.00
- 4.01 - 4.50
- 4.51 - 5.00
- 5.01 - 5.50

Title: Interpolated Peat Depths	
Loch Toftingall Wind Farm Scoping Report	
Source:	
Client: Infinergy	
Drawn by: SC	**Checked:** HK
Date: 30/04/2019	**Figure:** 12
Scale: 0 150 300 m	**Revision No:** 1

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Figure 13: Potential Noise Receptors

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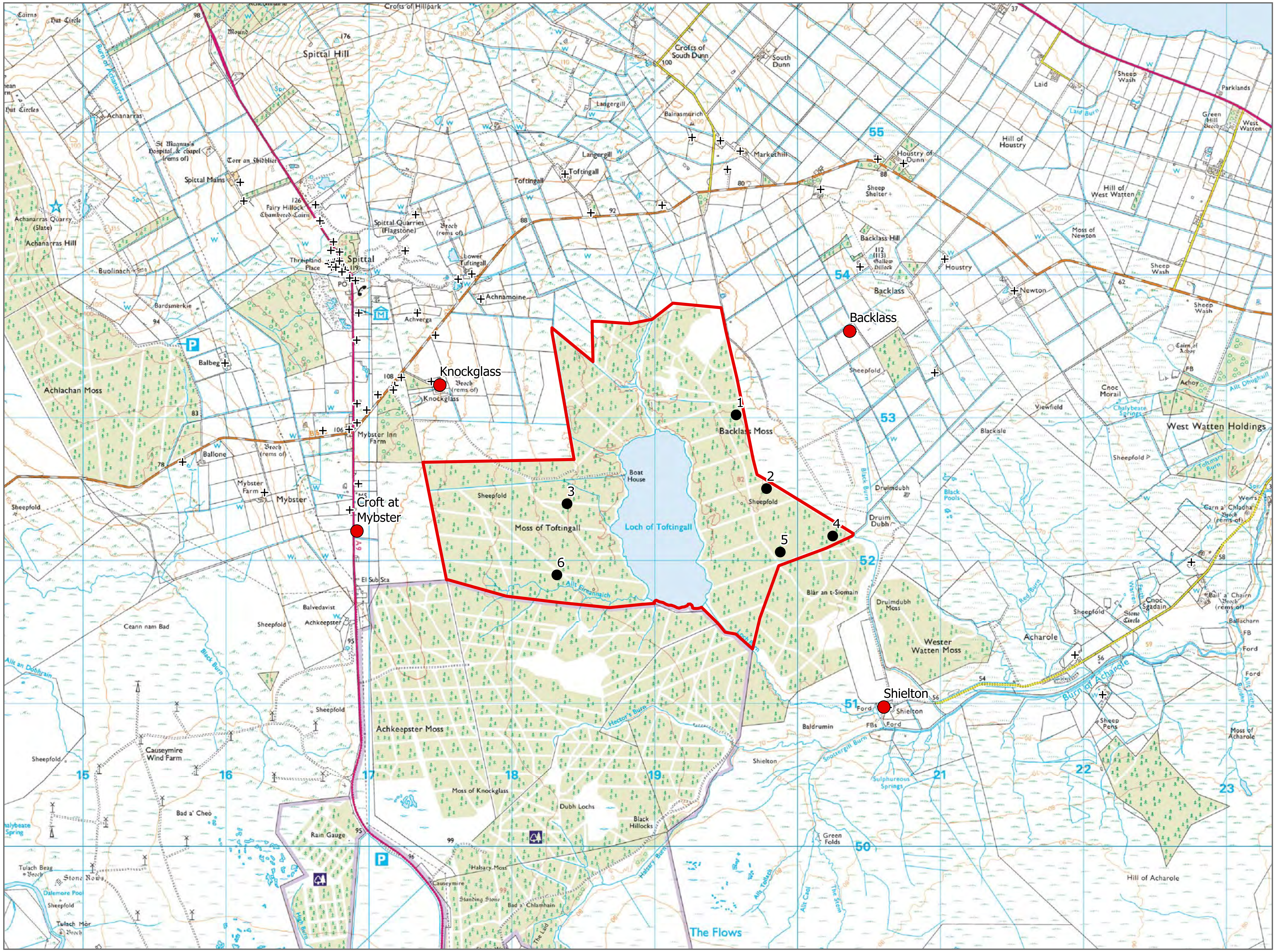

Legend:

- Site Boundary
- Key Receptors
- Other Receptors

Title:	Potential Noise Receptors
	Loch Toftingall Wind Farm Scoping Report
Source:	© Crown copyright and database rights 2018 Ordnance Survey 0100031673
Client:	Infinergy
Drawn by: SC	Checked: HK
Date: 30/04/2019	Figure: 13
Scale: 0 200 400 m	Revision No: 1

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Legend:

✱ Loch Toftingall

Title: VFR 250k Chart Extract

Loch Toftingall Wind Farm Scoping Report

Source: © Crown copyright and database rights 2019 Ordnance Survey 0100031673

Client: Infinergy

Drawn by:	Checked:
SC	HK
Date: 13/05/2019	**Figure:** 14
Scale:	**Revision No:** 0

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APPENDIX B – CONSULTATION

22.5. The process of identifying environmental effects is both iterative and cyclical, running in tandem with the iterative design process. Consultation forms an integral role throughout the EIA process.

Scoping Consultation

22.6. Infinergy is fully committed to a thorough engagement process aiming to ensure that communities are consulted and informed of developments during, and beyond, the EIA process on all projects. This is achieved by a variety of methods as appropriate including public exhibitions, meetings and circulars. Public consultation will be incorporated into the iterative design process and recorded in appropriate sections of the EIA Report. Planning Advice Note (PAN) 81 on Community Engagement provides advice on how communities should be properly engaged in the planning process and forms a basis for potential activities.

22.7. Comments are specifically invited on:

- The proposed content of the EIA Report;
- Assessment methods;
- Additional data sources; and
- Additional consultees.

22.8. In terms of the proposed content of the EIA Report, it should be emphasised that one of the aims of this scoping report is to scope out any issues which are known not to be significant from further consideration and to highlight and focus on the main issues which should be assessed within the EIA Report.

22.9. This scoping report will be submitted to the Highland Council (the planning authority) with a request for a formal EIA scoping opinion. The suggested scoping consultees are listed below:

List of Consultees

- SEPA
- SNH
- Historic Environment Scotland
- Watten Community Council
- Atkins
- Civil Aviation Authority – Airspace
- Crown Estate Scotland
- BT
- Defence Infrastructure Organisation
- Fisheries Management Scotland

- Scottish Forestry
- Highlands and Islands Airports
- John Muir Trust
- Marine Scotland
- Mountaineering Council of Scotland
- NATS Safeguarding
- Ofcom
- RSPB Scotland
- Scottish Rights of Way and Access Society
- Scottish Water
- Scottish Wild Land Group
- Scottish Wildlife Trust
- Transport Scotland
- Visit Scotland

Public Consultation

22.10. As part of the consultation process, the Applicant will engage with the local community in order to inform local people about the proposals, to explain the development and its likely effects and to take on board any concerns or issues.

22.11. The following further pre-application community involvement activity is proposed:

- The creation of a project specific website with information about the project;
- Written consultation to Councillors and the Chair of the relevant committee to include information about the project along with a summary of public consultation to be carried out;
- Placement of an advert in local paper(s) announcing the project with reference to the project website for further information and including information on community engagement events; and
- Public exhibitions – Infinergy will closely assess the consultation zone and will then decide on the location and timing of a public exhibition.

22.12. The EIA Report will include a summary of the pre-application public consultation carried out. In addition, a pre-application consultation report will be prepared which will detail all of the pre-application public consultation undertaken. This would be submitted alongside the planning application.

APPENDIX C – CUMULATIVE SITES

Cumulative Wind Farms within 20 km	
Operational	
Causeymire Wind Farm	21 Turbines – 101m to blade tip
Lochend Wind Farm	4 Turbines – 100m to blade tip
Stroupster Wind Farm	13 Turbines – 110m to blade tip
Bilbster Wind Farm	3 Turbines – 93m to blade tip
Wathegar Wind Farm	5 Turbines – 100m to blade tip
Wathegar II Wind Farm	9 Turbines – 110m to blade tip
Achairn Wind Farm	3 Turbines – 100m to blade tip
Camster Wind Farm	25 Turbines – 100m to blade tip
Burn of Whilk Wind Farm	9 Turbines – 116m to blade tip
Buolfruich Wind Farm	15 Turbines – 75m to blade tip
Baillie Wind Farm	21 Turbines – 115m to blade tip
Under Construction	
Bad a Cheo Wind Farm	13 Turbines – 112m to blade tip
Achlachan Wind Farm	5 Turbines – 115m to blade tip
Planning Permission Granted	
Achlachan II Wind Farm	3 Turbines – 110m to blade tip
Halsary Wind Farm	15 turbines – 120m to blade tip
Cogle Moss Wind Farm	12 Turbines – 100m to blade tip
Rumster Community Wind Energy Project	3 Turbines – 75m to blade tip
In Planning	
Golticlay Wind Farm	19 Turbines – 130m to blade tip
Limekiln Wind Farm (Resubmission)	21 Turbines – 139m and 126m to blade tip

Cover image for illustrative purpose only

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